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JANUARY, 1927

No. 1.

Citrus Culture in Florida and California

By Robert W. Hodgson

University of California

THE WRITER was recently afforded the opportunity to make a survey of the Florida citrus industry and a study of the orchard management and cultural practices employed by the growers. In view of the increasing intensity of competition between Florida and California, and the widely different methods used by the growers in the two states, a brief summary of the status of the industries, and of the salient points of difference in the cultural methods followed, may be of interest to the growers of both states.

Tendencies in Production

The economic backgrounds of the industries are shown in the accompanying tables. The first two give the bearing and non-bearing acreage by varieties, and the last two show the production in boxes by varieties in recent years. It will be observed that the total acreage planted to citrus fruits in the two states is approximately the same, although the distribution by varieties is markedly different. Oranges and grapefruit comprise approximately 90 per cent of the Florida acreage, the remainder being devoted principally to tangerines, while in California, oranges and lemons constitute 95 per cent of the total, the remainder consisting of grapefruit.

It will be further noted that the per cent of bearing acreage ranges from 50 per cent for tangerines to 65 per cent for the grapefruit in Florida, while in California the range is from 60 per cent for grapefruit to 94 per cent for lemons. It is clearly evident that, barring unforeseen contingencies, large increases in citrus fruit production may be expected in the next decade in Florida, while the orange and lemon industries in California are not likely to show any marked increases in production.

The rapid increase in production of oranges and grapefruit in recent years, culminating in the record break-

ing crop of 1923-24, is clearly shown in Tables 3 and 4. The effect of the 1925 freeze in southern California and the influence of the subdivision boom in Florida are also evident, the net result being that during the past two years production has not yet caught up to the record established in 1923-24. As to whether this is the basic reason for the good prices received by the growers in both states during this period is perhaps a question, but in the opinion of the writer, this conclusion seems justified. It also seems probable that a recurrence of bumper crops in the two states may be expected within the next five-year period, with the production of a total citrus fruit crop far in ex-

cess of anything which has occurred in the past.

Climatic Resemblances and Contrasts

The two states are similar in their greatest natural resources—climate—both possessing a subtropical climate. It is for this reason that the major trends in agricultural development in the two states are toward subtropical fruit culture, the production of winter truck crops, and the growing of flowers and ornamentals. The basic climatic similarity has to do with minimum winter temperature and length of growing season. In both states, winter temperatures are relatively high, rarely falling below the freezing point, and with minor excep-

tions the growing seasons are much longer than elsewhere in the United States.

Florida has a subtropical climate because of her location with respect to latitude. An additional influence tending to raise the mean temperature is the Gulf Stream. California, on the other hand, although situated far to the northward, is rendered subtropical by a combination of causes, principal among which are the protection afforded by the high Sierra Nevada range on the east and north, and exposure on the west to the warm winds from the Pacific Ocean.

From this point on, the climatic similarity ceases, and contrasts become evident. The chief difference, and one which markedly affects conditions in the two states, lies in the moisture factor. Surrounded by warm ocean water, literally filled with lakes, and subjected to a summer rainfall of from 40 to 60 inches, Florida has a distinctly humid climate. In marked contrast, California has a relatively short rainy winter season and an extremely long, dry spring, summer and fall. During much of the year the atmospheric humidity in Florida ranges between 80 and 95 per cent, while in California the range is very much wider and the mean much lower. The result of these differences is that Florida enjoys a humid subtropical climate, whereas that in California is distinctly arid.

Thus far only two subtropical fruits of economic importance have been found to succeed commercially under the widely differing climatic conditions in the two states. These are the citrus fruits and the avocado, the former withstanding the aridity of the California climate sufficiently well to be commercially successful, and the latter tolerating the humidity of the Florida environment. Competition in subtropical fruit culture between the two states is therefore limited to these two fruits, the former being at present the more important.

(Concluded on page 26)

TABLE 1.—FLORIDA CITRUS ACREAGE—1926.

	Bearing.	Non-bearing.	Per cent in bearing.	Total.
Oranges	95,000	65,000	59	160,000
Grapefruit	48,000	22,000	69	70,000
Tangerines and miscellaneous....	5,000	5,000	50	10,000
Total.....				240,000

TABLE 2.—CALIFORNIA CITRUS ACREAGE—1926.

	Bearing.	Non-bearing.	Per cent in bearing.	Total.
Oranges	185,000	15,000	92	200,000
Lemons	45,000	2,000	94	48,000
Grapefruit	6,000	4,000	60	10,000
Total.....				258,000

TABLE 3.—ORANGE PRODUCTION—1922-26—(BOXES).

	1922-23.	1923-24.	1924-25.	1925-26 (estimates).
Florida	8,528,000	12,764,000	9,850,000	8,500,000
California	22,296,000	21,031,000	16,472,000	21,600,000
Total	30,824,000	33,795,000	26,322,000	30,100,000

TABLE 4.—GRAPEFRUIT PRODUCTION—1922-26—(BOXES).

	1922-23.	1923-24.	1924-25.	1925-26 (estimates).
Florida	6,325,000*	7,435,000	7,878,000	5,510,000
California	260,000	210,000	200,000	325,000
Total	6,585,000	7,645,000	8,078,000	5,835,000

*Only 75 per cent of crop harvested.

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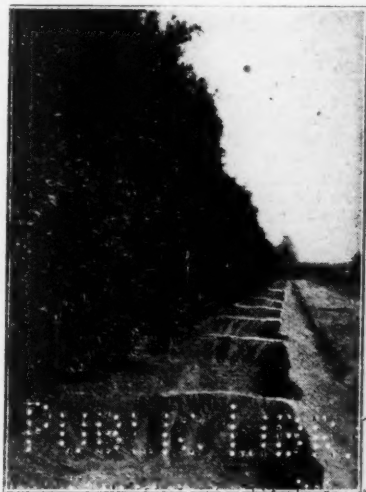
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View of a typical hammock citrus grove in Florida. No irrigation is necessary. Cultivation is practiced in many groves, but cover crops are permitted to grow in many also.



A typical citrus grove in California. The land is prepared for basin irrigation, which method is commonly used on the lighter soils.

Pruning the Vine in California

By Frederic T. Bioletti

University of California

THE GRAPES of California are the fruit of the plant beloved of Bacchus whose praises have been sung by the poets of all ages, from those of ancient Greece and Rome to that of the Eighteenth Amendment. The botanists call it *Vitis vinifera*—the wine-making grape—and it differs markedly from the eastern grapes, such as the Concord, the Isabella and the Catawba,

vious season, which are needed for fruiting the next year, are left at or near the ends of the arms. These spurs vary in length from four to eight inches and consist of one to three internodes with their corresponding

A cordon is a vine of which the trunk rises vertically for two to three feet and then curves in a quarter circle until it becomes horizontal at three to four feet (see Figure 2). The horizontal part extends until it reaches and rests upon the upper part of the curve of the next vine in the row. The whole trunk is usually from 10 to 12 feet long. A vineyard of cordon vines in winter after pruning has the appearance of a series of cables (cordons) stretched across the field. A cordon requires a trellis of two wires—one stretched at the height of the horizontal part of the trunk, which it supports, and the other at 12 to 18 inches higher, to support the fruit bearing canes and to keep the fruit well off the ground.

With this system the bunches are all kept at about the same distance from the ground and are exposed in equal measure to sunlight and movement of air. The method facilitates thinning and harvesting and when well done increases the total weight of crop and the size and quality of the bunches.

Cane Pruning

With most systems of pruning vinifera grapes, about three-quarters of the canes (mature shoots) which are produced each year are removed entirely at the winter pruning, and the remaining quarter are shortened to spurs at two to four buds. From 85 to 90 per cent of the annual growth is thus removed each year, and only

them in a circle and tie them to the stump of the vine (see Figure 4). This obviates the need of a trellis, but has the same disadvantage as the head system in crowding the bunches.

The buds a little removed from the base of the cane are not only more fruitful than the buds of spurs, but they tend to produce larger and finer bunches. Unfortunately, with many varieties, cane pruning tends to cause overbearing, with the result that the bunches and berries are restricted in size and quality by the inability of the vine to properly nourish them. This defect can be overcome by thinning the blossom bunches, that is, removing all the bunches of blossoms in excess of the number suitable for the particular vine as soon as these blossom bunches appear. A. J. Winkler of Davis has obtained remarkable improvement in quality and yield by this means, and it seems probable that many, if not all, varieties usually pruned short can be made to give better results with cane pruning if this early removal of excessive blossom bunches is practiced.

The use of fruit canes is applicable to either head pruned vines or cordons.

Relative Merits of the Three Systems

The head or goblet system with spurs is the simplest and the cheapest, for with it the vine requires no support except a grape stake three to six feet long during the first five to eight years. This results in a saving of from \$20 to \$30 an acre for installation and a further saving each year for upkeep, which may be estimated at about \$5 an acre, representing another \$75 of investment. The absence of a trellis also makes it possible to cross plow and cultivate, which has great advantages, especially where bad weeds are prevalent.

In spite of these advantages, however, more vineyards are being trellised every year. The advantages of the trellised cordon in larger crops and better fruit have already been pointed out, and the disadvantage of permitting cultivation in only one direction is less than it seems at first, as the vines are planted by the avenue system, that is, they are set closer together in the row—six to seven feet—and the rows are set farther apart, 12 to 14 feet, instead of being set nine by nine feet or 10 by 10 feet or eight by 12 feet, as with the head system. Avenue planting makes it possible to reach every part of the vineyard with vineyard trucks for hauling boxes,

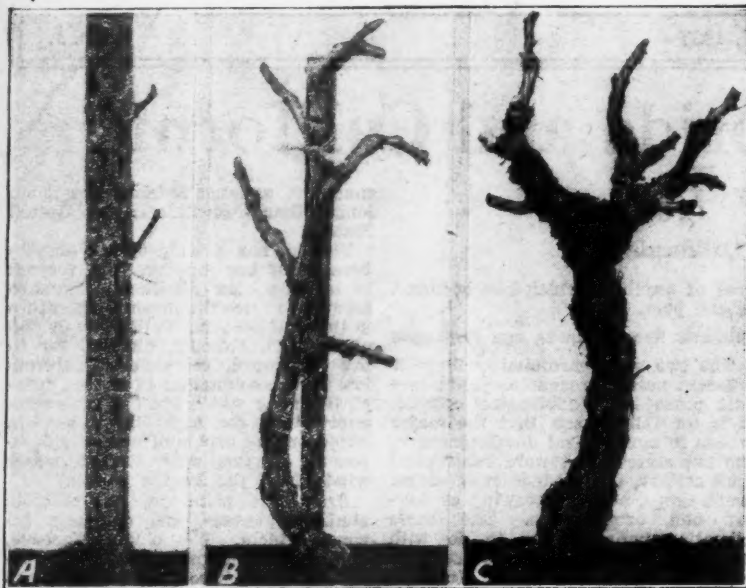


Figure 1.—Appearance of a vine trained according to the head system after the pruning of the second (A), third (B), and fourth (C) winters

which belong to the species *Vitis labrusca*, a wild vine of the northeastern states. Longfellow's poem on "Sweet Catawba Wine" is evidence that he was neither a botanist nor a wine connoisseur.

The grapes grown in California differ from those grown in the eastern states in characteristics, climatic requirements and the cultural care they need. The methods of pruning used in the state are varied but are nearly all very different from those practiced east of the Rocky Mountains. The differences are due partly to the nature of the varieties, and perhaps partly to the climate. The dry air and the absence of summer rain and of intense winter cold make it possible to use certain simple methods which would be less successful in the East.

Head Pruning

The typical form given to the vine in California, as in most of the countries of the world where vinifera varieties are grown, is that of a small, upright, self-supporting shrub. It consists of a clean, straight trunk which usually varies in height from 12 to 36 inches, but which may reach four or five feet, or be reduced to almost nothing. Large, vigorous varieties, such as Tokay, require a high trunk; weak growers, such as the Zinfandel, do well with a moderately short trunk. A trunk less than 18 inches tall is considered defective in all cases.

The purpose of the trunk is to raise the fruiting wood high enough to keep the grapes off the ground and to make it possible to cultivate close to the vines and to remove or prevent the growth of suckers (shoots from below the ground). Table grapes, especially those with large bunches, require comparatively high trunks in order that the bunches may hang free from each other and from the soil. The trunk should be free from large wounds and well covered with sound bark. This is the best protection from "Esca," the internal decay of the trunk. At the top, the trunk divides into arms spreading at an angle of 45 degrees, or less from the vertical. These arms are allowed to grow from eight to 18 inches long, according to the size and height of the vine. The spurs or pieces of the canes grown the pre-

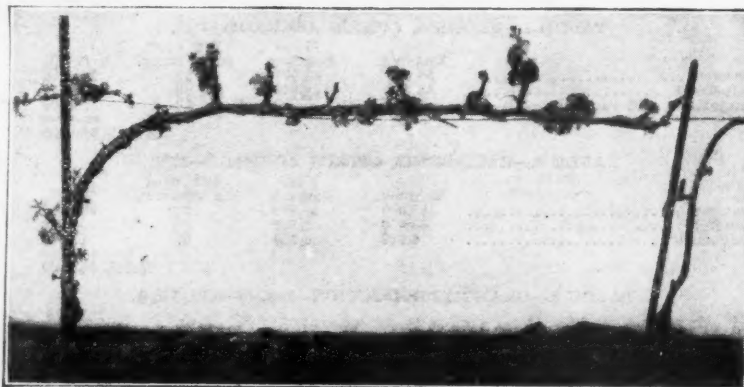


Figure 2.—A vine trained according to the cordon system

buds. A well pruned vine suggests the form of a long-stemmed wine glass, and the system is often called goblet or vase pruning.

From the buds of the spurs grow green shoots which develop into mature canes which bear the bunches of fruit at eight to 18 inches from their base. A symmetrical vine pruned in this way will bear a band of bunches of fruit hanging in a rough circle with a radius of two to three feet from the vine as a center and two to four feet from the ground, according to the size of the vine.

This is, of course, an ideal case, to be approached as nearly as may be. The nearer the approach, the better and more evenly the bunches will develop. The way in which a vine is trained into the desired shape is indicated in Figure 1, which shows a vine after the winter pruning of the second, third and fourth years.

Cordon Pruning

Even with the greatest care, it is difficult with the usual head pruning to obtain a large proportion of the crop in the form of bunches sufficiently near perfection for marketing as first quality table grapes. Many of the best of our table grapes, moreover, do not do well with the comparatively short trunk that is necessary with this system. Both these objections are removed by using the cordon system.

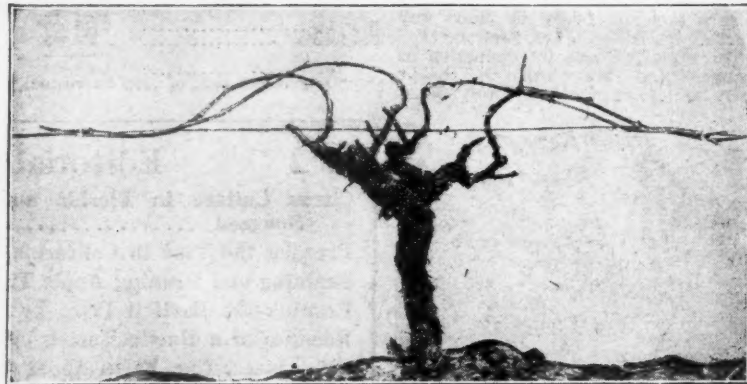


Figure 3.—This picture illustrates the method called cane pruning

buds near the base of the canes are left to produce shoots and grapes for the next year.

Some varieties do not bear well from the base buds. With these it is necessary to leave longer portions of the canes. Instead of short spurs, "fruit canes" two to three feet long with six to 12 buds are left. These fruit canes require support, which is usually supplied by a trellis similar to that described for cordon vines (see Figure 3). Another method of disposing of these canes is to bend

grapes and manure, and it facilitates the use of tractor-drawn tillage implements.

The difficulty of controlling weeds, except some of the worst, such as morning glory and Johnson and Bermuda grass, is not serious with the new inter-vine cultivators which are being used commonly now. Moreover, while the cordon vine requires more skill and labor than the headed vine during the first three or four formative years, the annual pruning of

(Concluded on page 30)

Training and Pruning Apple Trees

By C. D. Matthews
North Carolina State College

K raybill discovered in a distinct relation between the amounts of carbohydrates and nitrogen available in plants on the one hand and the type of growth and fruitfulness of the plant on the other. Other investigators have furnished additional support to this viewpoint. These discoveries have added greatly to our understanding of pruning problems and have given us what appears to be a sound physiological basis upon which to plan our pruning practices.

Plants use carbohydrates and proteins in their life processes the same as animals. These basic food materials are formed by the plants from the raw food material obtained from the soil and the air. Any materials formed in excess of immediate needs are stored as reserves. Among other things, the reserve supplies of carbohydrates and nitrogen are used in the production of new growth. Variations in the kinds and amounts of these food materials in the plant cause a variation in the kind of growth which results. Certain nutritive conditions encourage blossom bud formation, while others encourage vegetative growth. Between these two extreme conditions, lies the condition which promotes good foliage development and an average amount of growth, followed by the formation of vigorous blossom buds each year and consequently annual fruiting, which is the object of every fruit grower.

The relation between the kind and amount of food materials and the type of growth is summed up in the following table:

High nitrogen—low carbohydrates: Dark green leaves, long willowy growth.

Low nitrogen—high carbohydrates: Light green leaves, stiff slender growth.

Medium nitrogen—medium carbohydrates: Green leaves, medium, to long thick growth.

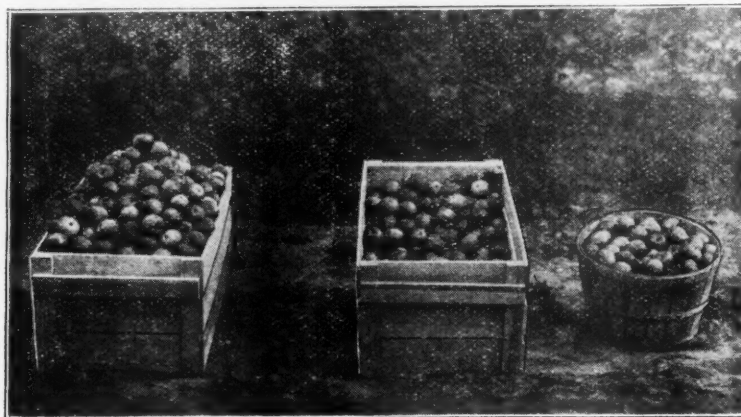
The first condition described is found in trees of extreme vigor, and is generally typical of young trees and more especially of young trees before they come into bearing. The second condition is found in trees of low vigor, and is typical of old trees which have become weakened and are making very little or no annual growth. Neither of these two types of trees is fruitful, certainly not from the standpoint of profitable crops. The third condition is typical of trees in good, vigorous condition which produce crops each year. It is necessary for carbohydrates to be manufactured and to accumulate in order that blossom-bud formation may be brought about, but the presence of carbohydrates does not always guarantee strong blossom buds that will set fruit. The best example occurs in old trees. They contain large amounts of accumulated carbohydrates, but do not produce blossom buds and set fruit because of the absence of a sufficient amount of nitrogen. If the nitrogen content is increased, larger and greener leaves are formed, more growth is made, and strong blossom buds are produced that will set fruit. In the case of young trees, large green leaves should not always be associated with an accumulation of carbohydrates. It is customary for young, vigorous trees to be low in carbohydrate content because this food is used in growth. Occasionally, a sufficient quantity of carbohydrates is not manufactured in this type of tree because of excessive shading.

Types of Apple Fruit Buds

Apple fruit buds may be of three kinds, as follows: (1) terminal, that is, formed at the ends of shoots which have made a growth of several inches or more; (2) axillary, that is, formed at the bases of leaves along the shoots, usually on strong growing shoots; and (3) fruit spur buds, that is, buds formed on fruit spurs, which as a rule are very short growths, often less than an inch in length.

Strong fruit buds are apparently developed as a result of the manufacture and accumulation of carbohydrates in the buds and twigs, together with the presence of nitrogen. Under proper

leaves produce blossom buds that set, provided there is an ample supply of nitrogen present. Anything that interferes with the functioning of these leaves, such as the loss of leaf surface



Effects of heavy and light pruning on earliness of bearing and yield. At the left is shown three and three-fourths bushels of apples, which was the average obtained from lightly pruned eight-year-old Winesap trees. The two and one-half bushels in the center represent the average yield secured from moderately pruned eight-year-old Winesap trees. The bushel of apples at the right is the average yield from heavily pruned eight-year-old Winesap trees

nutritive conditions, any vegetative bud may become a blossom bud. Each bud is dependent to a large extent upon the leaves adjacent to it for its supply of elaborated food. Large

or shading, restricts blossom bud formation. The grower should understand, however, that to a certain extent the tree responds as a unit to the nutritive relation, but trees that have

TABLE 1.—COMPARISON OF HEAVY AND LIGHT PRUNING IN RELATION TO SIZE OF TREES

Variety.	Age.	Heavy pruned—		Light pruned—	
		No. of trees.	Diam. of trunk.	No. of trees.	Diam. of trunk.
Rome	8	11	2.73 in.	7	3.21 in.
Winesap	8	10	3.52 in.	8	4.43 in.
Stayman	8	10	3.92 in.	7	4.36 in.
Delicious	8	11	3.26 in.	8	3.83 in.

Investigations at a number of stations have shown the value of trunk diameter as an index to comparative size of trees.

TABLE 2.—COMPARISON OF HEAVY AND LIGHT PRUNING IN RELATION TO EARLY BEARING WITH SEVEN-YEAR-OLD TREES

Variety.	Age.	Heavy pruned—		Light pruned—	
		No. of trees.	Average yield. Lb. Oz.	No. of trees.	Average yield. Lb. Oz.
Rome	7	11	2 6	7	26 6
Winesap	7	10	0 12	8	35 4
Stayman	7	10	7 12	7	30 0
Delicious	7	11	0 0	8	15 0

TABLE 3.—COMPARISON OF HEAVY AND LIGHT PRUNING IN RELATION TO EARLY BEARING WITH EIGHT-YEAR-OLD TREES

Variety.	Age.	Heavy pruned—		Light pruned—	
		No. of trees.	Average yield. Lb. Oz.	No. of trees.	Average yield. Lb. Oz.
Winesap	7	10	75 0	8	177 0



Effect of heavy and light pruning on growth. The tree at the left was heavily pruned each year, while that at the right was lightly pruned. Both are eight-year-old Winesap trees

the best balanced relation between carbohydrate and nitrogen content have the best chance of forming strong blossom buds each year, and also in these trees the buds with the largest leaf areas make the strongest blossom buds.

When the fruit grower understands that there is a definite relationship between the kind of foods in the plant and the type of growth that results, and further that there is a relation between the growth of leaves and twigs and the development of strong blossom buds, and when he once understands that pruning may influence very materially the relationship of the plant food within the plant, he can see clearly how important a part pruning may play in regulating the productiveness of his trees and, consequently, their profitability.

It should be understood that in all pruning problems, large trees and high yields are very closely associated with a plentiful supply of soil moisture and fertility. Good orchard management should not only consider pruning in relation to the type of growth and fruitfulness of apple trees, but it should also consider soil moisture and fertility as controlled by orchard soil management.

Pruning Young Trees

The objects in the mind of the apple grower when he prunes young trees should be to secure mechanically strong trees capable of supporting large crops of fruit, which will come into bearing at any early age and which will have a large bearing surface well distributed over the trees.

These three considerations are greatly influenced by pruning, and they have been defeated in many orchards by the system of training employed. Experience at the North Carolina Agricultural Experiment Station and other experiment stations has shown that the modified leader type of training lends itself best to the attainment of these objects. The modified leader type is a combination of the open head and the central leader type. In general, it is developed by training the trees to the leader type for the first four or five years and from then on treating them as one would treat open headed trees. These trees are low headed, spreading, and have from six to 10 scaffold branches distributed along and about a central stem. It is not possible to secure the several scaffold limbs from one season's growth and have them properly distributed and in proper balance, so the selection must extend over some three or four years, starting two or three new scaffold limbs each year. After the proper number and distribution of scaffold limbs has been obtained, the trees should be opened by discontinuing the leader. The modified leader system produces very strong trees, capable of supporting large crops of fruit.

In pruning young trees, work at the North Carolina Agricultural Experiment Station and other experiment stations indicates that the best method of securing large trees which come into bearing early consists largely of corrective pruning in the form of thinning out, with a minimum of heading back—heading back only where it is necessary to maintain the desired form of tree and to maintain a proper balance between scaffold limbs. Cutting back young trees made them smaller. Table 1 shows the comparative value of light and heavy pruning with respect to size of trees.

The lightest pruning which is consistent with securing a desirable framework is the type that should be employed in bringing trees into bearing. At the North Carolina Experiment Station, trees that have been lightly pruned by thinning out rather than by heading back are larger, possess a much greater area of spur bearing wood, and come into bearing earlier than trees that have been heavily

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Reclamation Projects and Farm Relief Measures

PRESIDENT COOLIDGE in his message to Congress took a stand against relief measures for agriculture which would result in better prices to producers. To state it another way, he does not believe in anything that partakes of the nature of a subsidy so far as agriculture is concerned.

In another part of the message he encouraged the development of reclamation projects in the West. The greatest possibilities in this direction, he stated, consisted in the impounding of water of comparatively large streams. Such projects, he reasoned, were beyond the means of private initiative, and he therefore took the position that government participation was justified.

It seems to us that government participation in matters like this is as clearly a subsidy as farm relief measures would be. There is absolutely no distinction between the two in our opinion. One is as justified as the other from a subsidy standpoint. From the standpoint of public policy, we believe farm relief measures are more justified than reclamation projects. Farm relief legislation would correct a serious national problem. We do not need more land brought under the plow at present. Large numbers of agricultural leaders in the western states agree with us in this viewpoint, but it seems that the opinions of real estate dealers, power companies, transportation agencies, engineering concerns and other organized groups have more weight at Washington than those of farmers and fruit growers.

Business Men's Commission to Study Agriculture

CHARLES NAGEL, former secretary of the United States Department of Commerce, has accepted the chairmanship of the Business Men's Commission on Agriculture, which has been created jointly by the National Industrial Conference Board and the Chamber of Commerce of the United States. According to announcements, the commission will study the agricultural situation in the United States with the object of developing a

program that will protect the national interest in the form of a sound and prosperous agriculture.

This new work is indirectly the result of the findings of the National Industrial Conference Board, which were presented a short time ago in a report which attracted a great deal of attention. The facts collected by the board and the analyses made by it show the agriculture of the country to be in a decidedly unfavorable condition as compared with business and industry. The report is regarded by agricultural leaders and economists as the most important of the kind ever made. The report is regarded as all the more important because the investigation was conducted by industrial-minded persons; in fact, when it was reported that the Industrial Conference Board would make an investigation of agriculture, farm leaders looked upon the proposition with great skepticism.

The National Industrial Conference Board did not attempt to develop a program. It simply collected the facts and presented them in a form in which they could speak for themselves. The joint commission will attempt to bridge the gap and develop a constructive program.

Without doubt the work of the commission will be watched with great interest. The commission has before it an opportunity to do a great piece of service, not only for agriculture but for the country in general. Let us hope that it will make a sincere effort to collect the evidence bearing on the situation, that the evidence will be fully and correctly interpreted, and that the facts will be made public.

The Grange Opposes Further Development Projects

THE NATIONAL GRANGE has recently taken a stand against the development of any further drainage and irrigation projects on government funds. The grange has taken a wise stand, in our opinion. The present large production of agricultural products constitutes one of the serious problems of agriculture. The bringing of more land under cultivation will simply aggravate the situation and will do no good for anyone except the interests which promote such projects and which profit from the sale of real estate, etc.

As population increases, the country will gradually need more land brought under cultivation. There are still large tracts of land which can be made productive, and there are ample means for providing for increased population. With the advance of time, more of our unproductive land can gradually be brought under cultivation at a profit, but certainly at present it would be unwise policy for the government to stimulate production by bringing more land under cultivation.

The Farm Work Shop

IF THERE is any one thing that is clear in regard to agricultural production, it is that the farmer and fruit grower must be a Jack-of-all-trades nowadays. Gasoline and electric motors, washing machines, spray outfits, lighting plants and many other modern developments have added a great variety of work to the responsibilities of growers. It is entirely out of the question to hire someone every time one of these outfits needs attention. No one on the farm can afford it. It is imperative that the average fruit grower and farmer make as well qualified a mechanic as possible out of himself.

In this connection the farm work shop deserves consideration. Many farms have no place that deserves the name work shop. Such repair work as is done is carried out in ordinary unheated sheds, in the barn, or in the basement in some cases.

Every grower should have a good work shop. The best kind is one which is well sealed and fitted with a good stove. In such a shop much valuable repair work can be done during the winter, when most growers are not very busy. All equipment can be gotten into first-class condition for spring and summer work. Much valuable time will thus be saved during the busy season when the wise grower makes every minute count.

In connection with such a work shop, it is a good plan to make during the active season a list of equipment which needs attention. It is a rather easy matter to make a list long enough to use up a large proportion of the spare time one has in the winter months.

The Last Argument

THOSE opposed to farm relief measures always fall back on one argument when they are met with clear logic. They state that if the government were to adopt measures that would improve prices for fruit growers and farmers, the growers would soon increase production to such a point that all relief measures would be rendered worthless.

We do not agree that reasonably better prices would appreciably increase production. It takes people and money to increase agricultural production. People in general have been convinced in recent years that farming has not been paying very well. They will not, therefore, begin to move to the farms in appreciable numbers the moment that better prices are in prospect. Furthermore, the whole history of civilization shows that city people move to farms only in a small way. The movement is practically all in the opposite direction.

Laborers in our cities are now getting good wages. They will most certainly not be offered sufficiently high wages in the event that farm relief measures are passed to cause many of them to seek positions as farm hands.

In addition to labor, capital will be needed to materially increase farm production. Capital seeks the most profitable investment. Other lines of endeavor are now producing larger returns than agriculture, and it is quite unlikely that a slightly improved price situation (agriculture expects only cost of production plus a reasonable profit, the same as any other industry must obtain if it is to survive) would attract capital away from business, industry and commerce into agriculture.

Let us grant, however, for the sake of argument, that the passage of farm relief measures would increase production. If such a thing should happen, our government would then be able to look its farmers square in the face and tell them that it had cleaned its hands, that it had done all it could, and that henceforth it was the job of farmers to develop methods of handling the surplus production they had brought about.

Until our government has placed itself in a position to make a statement of this kind, it cannot meet its farmers with a clear conscience. The assumption that passage of farm relief legislation would increase production and thereby defeat its purpose is probably not a valid one. Even if such legislation should increase production, the government would not, in anticipation thereof, be justified in refusing to make an honest attempt to place its farmers in a position of economic equality with other groups.

Those who take the view that better prices for farm products would increase production unnecessarily are indirectly assuming that it is necessary to keep farmers in a continued state of bankruptcy to prevent them from producing too much. The acceptance of such a philosophy is an impossibility from the standpoint of both the farmer and the country at large. A nation which claims to be enlightened cannot afford to allow itself to be influenced by such arguments.

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Pruning the Bartlett Pear

By A. H. Hendrickson

University of California

THE PRODUCTION of Bartlett pears has shown a marked increase during the past few years. Encouraged by the relatively high prices which prevailed during and immediately following the World War, large plantings of this fruit were set out. Thoughtful growers realize that the prices received during this boom period will probably not be equaled again, at least not for many years. In order to make a profit, they know it will be necessary to reduce the expense of growing the crop as much as possible. Certain charges, such as taxes, interest and water, remain approximately constant. With other items of expense, such as cultivating, cover crops, spraying and pruning, the cost varies somewhat from year to year, but in general these operations cost about as much when a small crop is produced as when the crop is large. Investigations with other fruits, as peaches for example, have shown that it costs nearly as much to grow a five-ton crop on an acre as it does to produce one twice as large. In producing the larger crop, the cost per ton is less than when a smaller crop is harvested. The pear grower, then, is faced with the problem of producing a large tonnage of high quality fruit per acre and thus reducing the cost per ton. Some of the factors involved in producing and maintaining high yields are cultivation, spraying, blight control and pruning. One of the most perplexing problems is how to prune pear trees for greatest production of high quality fruit.

Nature of the Bartlett Pear Tree

The Bartlett pear produces most of its fruit on spurs which ordinarily live for many years. One of the requisites of a high yielding pear tree is that it have an abundance of vigorous spurs well distributed over the tree. The pruning should be of such a nature as to avoid shading the spurs by dense foliage; to keep the fruiting wood in a healthy, vigorous condition; and to provide new spurs to replace the old and weak spurs, as well as those which are injured or broken off during harvest. The usual method of pruning mature trees consists in thinning out the smaller branches wherever the tree seems too thick and in cutting back to later-

als. The safest criterion of pruning is to be found in the response of the tree itself. If the tree bears heavily and also continues to make a suitable amount of new growth, it may be assumed that the pruning is probably being done in a satisfactory way. A

marked decrease in production, if accompanied by an increase in vegetative growth, usually indicates that the pruning has been too severe. Heavy cutting back tends to produce a few vigorous shoots from the buds immediately below the cut, with the

consequent production of comparatively few new spurs. Thinning out tends to encourage the production of fruit spurs, without the production of excessively long vegetative shoots. However, a certain amount of new wood each year is desirable, as it is upon this new wood that the fruit spurs are produced the second season.

Spur Pruning Sometimes Necessary

In very old trees or in orchards where the water supply is scanty, a condition is sometimes reached in which practically no new growth is made. Judicious cutting back in these cases is generally helpful in encouraging the development of new shoots upon which the fruit spurs are later produced. Orchards which have been in this weakly vegetative condition for a number of years often have too many old spurs, and the bearing of the tree may often be improved by removing about one-fifth or more of the old spurs (Figure 1). Such trees often set entirely too many fruits, and the general condition of the trees, as well as the size of the fruit, is often improved by this spur pruning.

Another condition which is sometimes found in old orchards is one in which the trees have entirely too many branches. These branches are often of considerable size, and it is difficult for the grower to realize that the removal of some of these branches would benefit the tree. Not many growers have the ability to look ahead and see what a tree will look like some time in the dim future. Branches which are only as large in diameter as lead pencils soon attain the size of broomsticks and then in a few years are two inches or more in diameter. A careful thinning in such cases often helps to re-establish fruiting wood in the center of the tree. This procedure greatly increases the bearing area of the tree. In one case observed by the writer, mature pear trees which had become too thick were carefully thinned by the owner. The entire job was not done, however, in one year, but several years were required for its completion. Instead of production falling off, it actually increased until the trees produced at the rate of slightly below 30 tons per acre, which

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Figure 1.—Aged Bartlett pear tree with an abundance of old, weak spurs. The productivity of such trees is often improved by removing a portion of the spur system

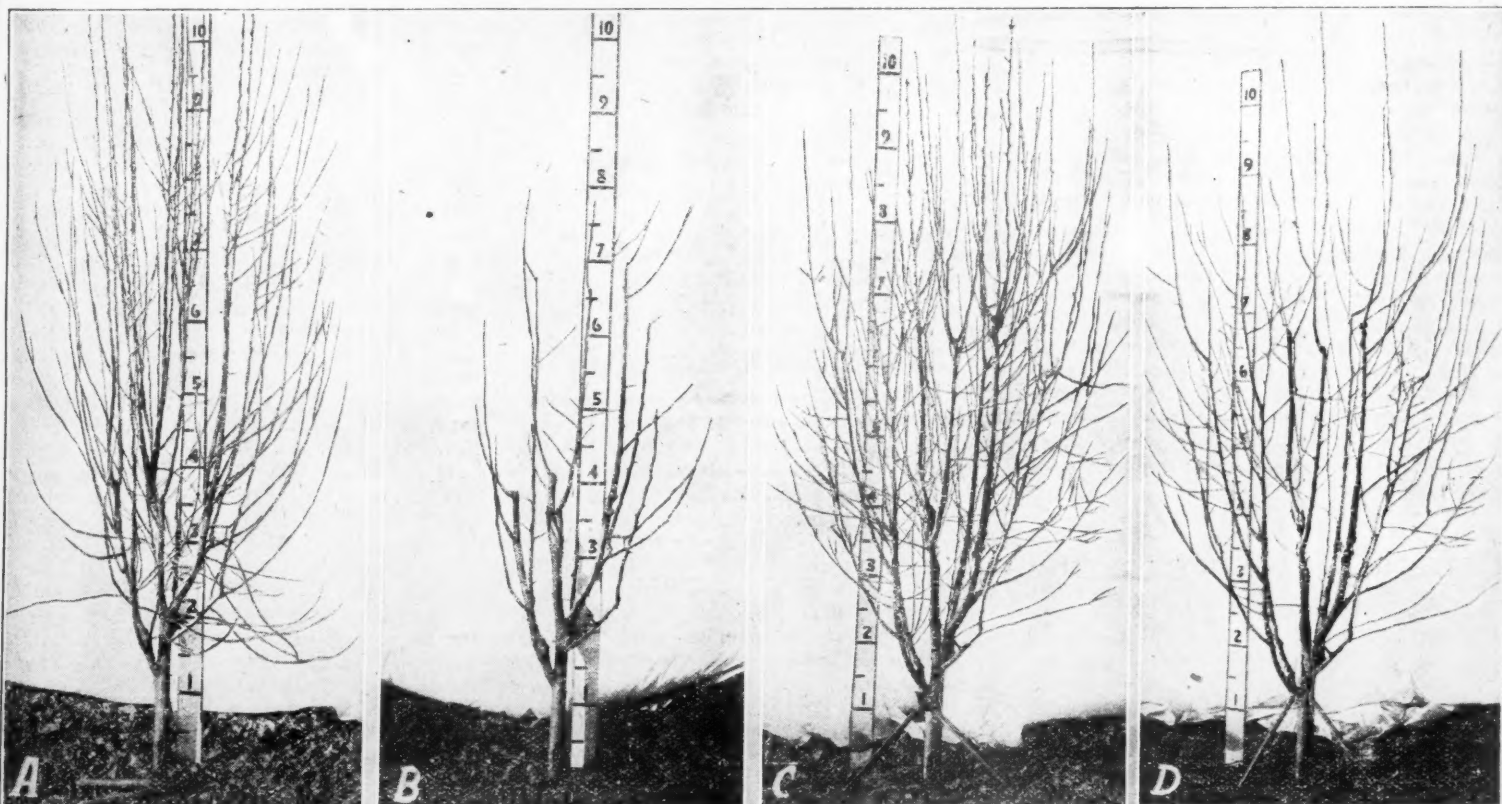


Figure 2.—A, three-year-old Bartlett pear tree with three main scaffold branches. B, The same tree after pruning. C, The same tree at four years of age. D, The same tree at five years of age, ready to go to work producing pears

Rambles of a Horticulturist

By C. E. Durst

AFTER the pomological party had spent two days visiting various parts of the famous Wenatchee district, and after the members had devoured a large proportion of the mountain trout of that section of the country at the never-to-be-forgotten fish fry on the banks of Icicle River, the Wenatchee Chamber of Commerce conveyed us in autos across country to Yakima. The 110-mile trip was made by way of the famous Blewett Pass, and there was magnificent mountain scenery in view practically all the way.

Arriving at Yakima, the party was well taken care of by the Chamber of Commerce and various other organizations. Within a day the party had visited a great many points of interest in the valley.

General Characteristics

The Yakima Valley is located in south central Washington. It is about 125 miles long and from five to 15 miles wide, running from northwest to southeast. Five tributary valleys are part of the district. About 300,000 acres of land are under irrigation, and much more can be brought under irrigation by the building of suitable reservoirs.

The district has about 40,000 acres in fruit. While it does not grow quite so many apples as are grown at Wenatchee, it grows larger quantities of most other fruits, and the total shipments of fruits are larger on the average than the shipments made out of the Wenatchee section. In addition to the fruits, large quantities of general farm crops are grown. The agriculture is much more diversified at Yakima than at Wenatchee. There are more newly planted orchards in evidence at Yakima than in any other section we visited in the Northwest.

The fruit shipments from the section in 1925 consisted of the following number of cars: apples 14,500, pears 2700, peaches 851, cherries 295, plums and prunes 243, apricots 27, grapes 183, strawberries 20, and mixed fruits 1900.

Irrigation Necessary

The rainfall at Yakima is about eight to 10 inches a year, most of which falls in the winter. At the time of our visit in early July, less than one inch had fallen since February. Irrigation is therefore necessary for the growing of all products. Several large irrigation projects supply the water. The systems are well developed. There are large ditches which bring the water from the reservoirs and distribute it to the various orchards, and in a number of places there are also other ditches which remove the excess of water from the land.

For the most part the winters at Yakima are mild. However, in some seasons the temperature reaches 20 degrees below zero. Such cold spells are of short duration. Occasionally they come early in the winter, and in such cases they cause considerable winter killing. As a rule, the cold waves last only a short time.

There is more damage from spring frosts at Yakima than at Wenatchee and smudging is more commonly practiced. The Delicious apple is quite subject to frost injury in the valley and for this reason is not as popular as at Wenatchee. The damage from hail is probably not as large as at Wenatchee on the average.

Soils, Fertilizers and Cover Crops

The soils at Yakima are rather rich in minerals, and it is unnecessary to supply phosphorus and potash. The nitro-

gen supply, however, is deficient. To supply this, the growers plant cover crops, consisting chiefly of alfalfa. This is rarely cut, and when it is, the cuttings are allowed to remain on the land. Considerable quantities of nitrate of soda and sulphate of ammonia are applied in addition. These are added usually in the spring of the

center of the tree. This method of training encourages the development of fruit buds and the production of highly colored fruit. Dr. Kloeber prefers to have the fruit buds develop in the exposed portions of the tree, as the fruits which set on the interior lack high color. He is opposed to heading back of any kind.



This apple tree, which is typical of thousands of trees in the Pacific Northwest, shows the open type of tree that is maintained. Note that the clear sky can be seen directly through the center of the tree. Orchard of J. S. Kloeber, Yakima, Wash.

year, although they are sometimes applied in the fall.

Pruning Methods

The pruning methods employed at Yakima are similar to those practiced in other northwestern sections. The trees are trained to open heads from the beginning. The accompanying picture shows how Dr. J. S. Kloeber is training his trees. The picture was taken in July, but even so the tree was sufficiently open that daylight could be seen through the

On the Arthur Evans place, consisting of 100 acres of orchard, we saw a most interesting demonstration of propping of pear trees. Mr. Evans has been practicing the Caldwell system of pruning successfully. We saw many pear trees whose branches had been spread apart by means of braces and props. This method promotes the formation of fruit buds for the succeeding year's crop. Like most other growers, Mr. Evans had alfalfa growing in his orchards.

We paid a brief visit to the orchard

of William P. Sawyer and there saw an extreme case of heading back of Bartlett pears. Mr. Sawyer heads back the annual growth every year, allowing but two to six inches to remain. His trees have made practically no gain in height during the last 16 years. He claims he has been getting good results and that he has been able to keep his trees within bounds by this kind of pruning.

Spraying

Yakima is bothered with practically the same insects and diseases that are common in other northwestern fruit sections. There are not so many stationary spraying outfits in operation as at Wenatchee, but the interest in these outfits is increasing, and the number will no doubt be enlarged. We saw a very interesting demonstration of one of these outfits on the place of Dr. J. S. Kloeber. This outfit supplied 78 acres of apples interplanted with Bartlett pears. The four cylinder pump of standard manufacture is run by an electric motor. It was supplying, with apparently no great effort, six spray guns at 500 pounds pressure. The six guns applied about 1000 gallons in 35 minutes. This amounts to about 15,000 gallons in a day of 10 hours. Dr. Kloeber states that seven men (one for each gun and one to watch the outfit and mix the spray material) can spray the apples on the entire 78 acres in 33 to 37 hours and the pears in 42 to 46 hours. The outfit cost \$5300. One-inch pipe is used for the mains and three-fourths-inch pipe is used for the laterals. A special pipe that is heavier than the ordinary kind is used. The longest main is 2400 feet. At the most distant outlet the pressure is only 31 pounds less than at the central plant.

Visit Nursery

We made a visit to the Washington Nursery Company at Toppenish, which proved extremely interesting. This nursery is said to be the largest in the Pacific Northwest. It grew 100 acres of fruit seedlings this season. Two tons of apple seeds were planted, the seeds being obtained from pomace mills located at Yakima. At the time of our visit, it was planned to set 800,000 buds during the budding season. The entire grounds are irrigated, and the conditions seem especially favorable for tree growth. Young trees grow so vigorously that they can be headed back in June and will then form a good framework before the end of the season. It is thus possible to produce in one season a tree which looks like a two-year-old. The nursery shipped 43 cars of seedlings east of the Mississippi River last season.

The Variety Question

The variety situation at Yakima is typical of what is taking place throughout the Northwest. In the early days numerous varieties were planted. As time advanced, it was found that many of these were unprofitable. Within recent years growers have been rapidly reducing the number of varieties. The number is now settling down to a very few in the case of all fruits. In the case of apples, a tree census taken in 1925 shows the following percentages of different varieties: Winesap 42.6,

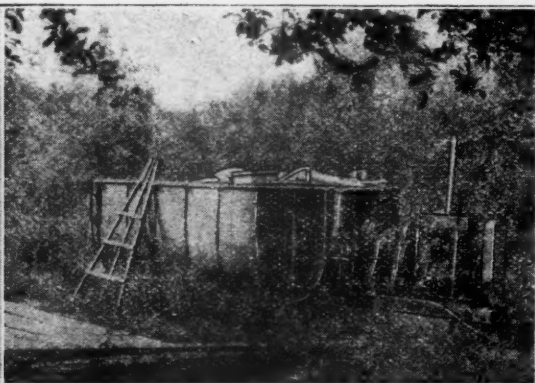
Jonathan 18.7, Delicious 13.6, Rome 12, and all others nine. Winesap, Rome and Delicious are gaining in acreage and the Jonathan is losing.

The pear varieties of Yakima consist of the following percentages of the total plantings in 1925: Bartlett's 71, Winter

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Irrigation ditches like this one are quite common in the Pacific Northwest. They are constructed along the higher ground so that the water can be distributed by gravity.



Power plant and mixing tanks for stationary spraying outfit in orchard of J. S. Kloeber, Yakima, Wash. The plant is to be covered with a building later.

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Some Interesting Facts About Apples

By T. J. Talbert

University of Missouri

THE APPLE is one of the oldest and most important of the fruits cultivated for their fleshy parts. It is universally recognized as the king of fruits. It is a native to the temperate forests of Europe and Asia and apparently was cultivated before the beginning of written history. Small apples, similar to those found wild at the present time in the Swiss forests, have been found in the ancient lake dwellings of Switzerland. The apple was grown as a garden fruit by the Phoenicians, Greeks and Romans, and from their written descriptions we know that the fruit had been improved considerably since the time of the lake dwellers. Historians have found references to the apple in the ancient and medieval literature of many countries. Investigations also show that the apple has been cultivated for centuries in many parts of the world.

Propagated by Seeds Until Recently

Although the art of graftage was known to the Romans, and has been practiced to some extent by gardeners since their time, it is probable that most apple trees were propagated by seeds until fairly recently. It must be remembered that until the last century apples were not grown primarily for their fruit, but for cider. Size and quality were, therefore, secondary considerations. There was a considerable apple industry in America during colonial times and during the earlier years of the republic.

Johnny Appleseed

One of the most interesting personages of this period was the semi-mythical Johnny Appleseed, who is said to have been the founder of the apple industry in the Middle West. Our knowledge of this man is based on a brief biography written on brown wrapping paper. He is said to have been a "very smart, intelligent young man" until he received a kick from a mule which fractured his skull. After that accident he became interested in apple growing and wandered from place to place planting apple seeds. He would obtain from cider mills all the apple seeds which he could carry on his back, and then go to some locality where apple trees were scarce and start a nursery. When his trees became old enough, he would sell them and get a new supply of seeds and move on to another settlement. It is said that he always had plenty of money, yet would walk without shoes even in winter. Instead of using a hat, he wore upon his head a tin kettle, which at meal time was used for culinary purposes. No doubt, however, this man, Jonathan Chapman, known as Johnny Appleseed, rendered a distinct and outstanding service to the early settlers of the Middle West by getting them to plant fruit trees. The apple industry was consequently encouraged and developed in this region much earlier than it might otherwise have been.

Variety Testing Period

It was during the period from 1830 to 1880 that the most marked improvement in apple varieties took place. Authorities have designated this as the amateur period in American horticulture. A great many men went into the orchard business during this time, many not for

money but for pleasure. They took a keen interest in the development of new varieties, and the ambition of the amateur apple grower was to have in his planting examples of every variety of apple known.

Even at the present time many horticultural societies offer small prizes at their annual fruit shows for promis-

nurseries who made great efforts to disseminate certain varieties in which they had financial interests.

The Ben Davis and Baldwin Battle

From 1880 to 1900 the commercial apple industry was increasing at a rapid rate. During this time the relative merits from the commercial standpoint of various varieties were being

the result of crosses where both parents were known. Hedrick of the New York Agricultural Experiment Station in 1912 stated that of the 3000 or more varieties of apples that had been described, not one is known to have come from a self-fertilized seed. Gourley of the Ohio Agricultural Experiment Station gives the origin of 633 recognized varieties of apples, as follows:

Both parents known.....	2
One parent known.....	39
Originated as bud sport.....	4
Neither parent known.....	588

It is an interesting fact that practically every variety of value and of commercial importance was originated as a chance seedling. By a chance seedling is meant the development of an apple from a seed that may have been dropped by man or by birds or distributed by other carriers or agencies. If a seedling tree is produced and reaches fruiting age, someone may observe its fruiting habits, and more especially the flavor, color and quality of the fruit produced. Promising and worthy chance seedlings have from time to time been brought to the attention of the public and particularly to the notice of nurserymen. The best of these have been named and propagated and introduced to the fruit growers. It took many years; therefore, to test varieties produced as chance seedlings, and no doubt some have been discarded that may have been worthy of propagation.

Apple Breeding, Not Selection, Important

Very little has been accomplished in the breeding of apples. However, our good varieties evidently arose as a result of crossing, even though the parents are unknown. There is a possibility of improvement in apple varieties through scientific breeding. Since there is apparently no opportunity of improving the apple by selection, natural or controlled, crossing is the only method available. Hence, it is reasonable to expect more new and profitable varieties to be originated in the future from controlled crosses or known parentage. This is true because very few seedlings are being planted by growers and less attention is generally given to chance seedlings, and nearly all of the agricultural experiment stations of apple producing states are carrying forward apple breeding projects.

The New York Agricultural Experiment Station reports that out of 106 individuals resulting from crossings, 14 were considered promising. Scion wood from these crosses has been sent to fruit growers and experiment stations for further test. One apple, named the Cortland, has been highly recommended, but has not been outstanding enough to even promise to replace the standard sorts of apples.

The Missouri Agricultural Experiment Station has been breeding apples for many years with the object of obtaining new varieties more resistant to spring frosts or which bloom later than the standard varieties now being grown. At the present time, 100 seedlings resulting from crosses appear promising enough to justify

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This picture shows medium, late and early blooming varieties of seedling apples. The tree marked A is in full bloom, that marked B is in the cluster bud stage, and that marked C has dropped its petals

ing new varieties of fruits. This practice was much more common, however, from 1850 to 1880. Fifty years ago these were the most important parts of the exhibit. Dean Bailey, formerly of Cornell University, has related how the grave and be-whiskered judges solemnly considered the plates of new sorts of apples and either pronounced them promising, recommending that further trials be made of them, or condemned them as of no value and forbade their further exhibition. Most of our standard apple varieties originated before or during this period, as a result of the interest of amateurs, aided by the

studied by experiment stations. The battle between the Baldwin and the Ben Davis was hotly waged, with victory for the Baldwin in the North and the Ben Davis in the South. Much breath and printers' ink were expended in deciding whether or not the Gano was a different variety from the Ben Davis. This period also marks the beginning of the scientific breeding of fruits by the state experiment stations.

Few Varieties Originated by Man

Since most of the described varieties of apples originated before 1900, it follows that few of them came as



Left—An eight-year-old promising seedling tree carrying a heavy load of apples. Right—An eight-year-old seedling apple tree from a Rome on Geneton cross which blooms about 10 days later than most standard varieties

The Grape Deal in the United States

By F. W. Read

California Fruit Exchange

THERE has rarely been a more spectacular and sudden increase in the production of any perishable agricultural commodity in the history of the nation than has been the case with the grape. As late as 1921, something less than 40,000 cars of fresh grapes were shipped from all of the producing areas of the country. In 1925, over 80,000 cars were shipped from the same districts, and in the year now closing the total production will closely approximate the latter figure. Carload shipments of grapes are nearly sufficient to supply a crate of 24 pounds net to every man, woman and child in the United States. Of this immense total, California produces anywhere from 75 to 85 per cent of the entire crop, depending upon the season. The brief table given below indicates the comparative importance of the leading states of commercial production in the shipment of grapes, and in addition conveys some idea of the remarkable strides this industry has made in the past few years.

California Grows Large Share of Tonnage

It will be noted at once that California has contributed a large share of this increase in tonnage. The carload shipments of fresh grapes have reached such proportions that the movement of this commodity over the rail lines, and the handling of the product in the terminal markets, has become a national question affecting the distribution of other perishable crops and involves economic considerations of vast importance to the country as a whole.

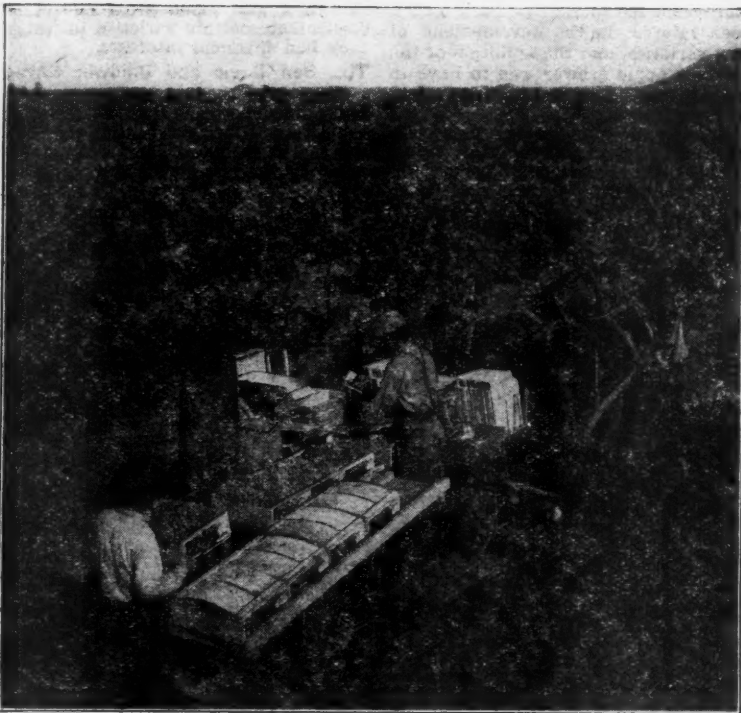
Farmers and fruit growers in sections of the United States other than California cannot appreciate the almost dramatic increase in the production of grapes on the Pacific Coast. The onward march of acreage and plantings in the Sacramento and San Joaquin valleys has practically subordinated all other lines of agricultural production in that state. The big impetus to grape planting in California was given during the period of abnormally high prices for raisins which prevailed during and after the World War. The control of the price situation by reason of a monopoly of the product resulted in a price level which proved exceedingly attractive, and the net result was greatly increased plantings. It has been stated that California grape growers, organized in a strong raisin association, failed to recognize one of the very fundamentals of economic procedure, namely, that while they might be able to control the price, they could not control production, especially of a crop which comes into bearing in the third year after planting.

Acreage Greatly Increased in 1919-21

The years 1919, 1920 and 1921 witnessed an unprecedented acreage planted to grapes in California. In 1919, the acreage of all grapes, including wine, table and raisin varieties, totaled but 322,000 acres. At the present time, according to figures released by the Department of Agriculture of California, the total bearing acreage in that state alone amounts to the astounding figure of 653,236 acres. If these huge plantings could be brought together in one great vineyard, they would cover an area larger than many of the states of the Union. The raisin grape varieties of California, including Thompson Seedless and Muscat, constitute the largest share of the total acreage, with wine or juice grapes ranking second, including such varieties as Zinfandel, Alicante, Mission, Carignane, Mataro, etc., and table grapes ranking third, including such leading varieties as Tokay, Malaga, Emperor and Cornichon.

Areas of Production in Far West

It might be well to point out that the grape varieties grown in California, as well as in Arizona, where a limited acreage is now coming on in



Harvesting scene in a California vineyard. Some growers claim the fruit retains its crispness and flavor better when packed in the field than when handled in large central packing houses

COMPARATIVE GRAPE SHIPMENTS FROM IMPORTANT STATES (SEASONS 1921 TO 1925) WITH ESTIMATE FOR SEASON OF 1926.

Leading districts.	1921.	1922.	1923.	1924.	1925.	Estimate.
	Cars.	Cars.	Cars.	Cars.	Cars.	Cars.
California	33,344	43,952	55,348	57,695	75,858	65,000
Michigan	1,292	6,020	4,202	4,680	398	5,000
New York	2,555	7,720	4,312	5,641	3,763	6,000
Pennsylvania	390	1,558	847	1,166	589	1,200
Others	256	669	627	751	1,061
Ozark Territory (Arkansas; Missouri, Oklahoma)	1,500
Total	37,817	59,919	65,336	69,933	81,669	78,700



Thompson Seedless grapes grown in the Salt River Valley of Arizona. The size of the berries and bunches and the crop of the vine as a whole are rather unusual and cannot be regarded as typical

the Salt River Valley, are confined mainly to the so-called European or Vinifera type of grape, quite different in general characteristics from the so-called slip skin eastern grape of the Labrusca type or from the Muscadine grapes of the South Atlantic and Gulf states. The major varieties of European grapes grown in California have been given above, but of course there are literally hundreds of varieties produced on the Pacific Coast, a description of which would fill a fair-sized catalog.

Grapes are grown in virtually every county in California, but the San Joaquin Valley is the main producing area, with production centered around the cities of Fresno and Lodi, and with plantings extending in almost a solid block up and down the course of this entire area. The high class Malaga table grape production centers in the Fresno district, while the Bright Flame Tokay finds its home in the Lodi and Florin sections in the north central part of the state. Thompson Seedless and Muscat, two other very important table grape varieties, also used for raisin and juice purposes, center in the lower San Joaquin Valley. Black juice grapes are raised throughout the state and are particularly famous in the Napa and Sonoma valleys of the coast sections north of San Francisco.

The earliest grapes in the United States are produced in the Coachella and Imperial valleys of southern California. These producing areas are below sea level and bring in their production of Malaga and Thompson grapes the latter part of June and early July. The Salt River Valley of Arizona, centering around the city of Phoenix, is virtually an extension of the early producing areas of southern California. The grapes produced in these hot, arid, reclaimed desert lands offer special problems in the way of production, packing and transportation apart from those encountered in other producing areas of the Pacific Slope.

Carlot shipments of California grapes usually begin in July, and continue well on through the month of November, with the Emperor grape, the beautiful red variety which keeps so well in cold storage, winding up the deal. The Emperor, one of the choicest of table varieties, is grown in California in Tulare and Fresno counties, and a large portion of the finest selection of this variety is placed in sawdust and stored in kegs or lugs for the holiday trade. California's peak of shipments usually occurs during the months of September and October, when Malagas, Tokays, Thompson Seedless, and the various black juice grape varieties are moving to market in a solid phalanx, oftentimes totaling as high as 1000 cars a day.

Grape Producing Areas of the East

Considering for a moment the grape producing areas of the East, the grapes of New York, Pennsylvania and Ohio are produced for the most part in a rather narrow strip of land called the grape belt, extending along the southern shore of Lake Erie. New York is next to the largest grape producing state in the Union. There are three small districts within the state in which grapes are grown commercially. First, and by far the most important, is the Chautauqua grape belt, extending along the southeastern border of Lake Erie. In the New York portion, this narrow belt averages three miles in width, and is about 50 miles long. On this narrow sloping plain, there are about 35,000 acres of grapes. The second important grape region in New York state is the so-called Central Lakes region of western New York, often called the Keuka grape district. Authorities agree there are about 15,000 acres of grapes in this section. The region along the Hudson River from Germantown to West Point is the third

(Continued on page 24)

SHERWIN-WILLIAMS

L. A. BOYD ORCHARD HAS PERFECT FRUIT

Mr. Boyd's 20-acre orchard is a sight to behold, specially from a fruiting standpoint. Mr. Boyd took this orchard in a somewhat run-down condition about 5 years ago and has developed new wood and generally built it up to the point where it can easily be called one of the show orchards of the county.

The trees are loaded down with perfect fruit.

He has consistently followed the spray schedule as outlined by County Agent, F. L. Simonton, and has used Sherwin-Williams "Dry Lime Sulfur."

This spray has kept Boyd's orchard under complete control from scale.



One of the most profitable orchards in Berrien County, Michigan—Apple Ridge Farm, at New Troy. Brought to high productivity with S-W Dry Lime Sulfur.
L. A. Boyd, owner, at left.

5 years of S-W Dry Lime Sulfur in L. A. Boyd's orchard

"the fruit is as near perfect
as it is possible to produce"
says *Bridgman (Michigan) Enterprise*

In 5 years the team of L. A. Boyd and S-W Dry Lime Sulfur have made run-down Apple Ridge Farm, New Troy, Michigan, one of the county's show orchards.

For restoring neglected properties or preserving healthy ones, rely on S-W Dry Lime Sulfur. It remains effective longer, is very economical to use, and harms only pests. Put this profit-improving spray to work for you!



Keep this valuable Guide handy

The S-W Spraying Guide and other literature give complete directions for controlling every orchard and garden pest. There is a Sherwin-Williams dealer near you. Ask him for this material or write us for a copy.

THE SHERWIN-WILLIAMS Co.
640 Canal Road, Cleveland, Ohio

SPRAY MATERIALS

Iowa Meetings and Mid-West Exposition a Success

THE IOWA State Horticultural Society and the Iowa Fruit Growers' Association held their annual meetings this year in connection with the Sixth Mid-West Horticultural Exposition at Des Moines on November 16-20.

The meetings were addressed by horticultural experts from Iowa and other states. Topics of particular importance to the growers of the Middle West were covered. It seemed that some of the sessions were a little crowded with speakers, but no doubt the growers desired to secure as wide a variety of information as possible.

The exposition was held in the Coliseum, which is a large structure. The building was completely filled with exhibits of fruits, vegetables and flowers from a considerable number of states, all arranged in magnificent fashion. There was a large attendance of citizens from Des Moines and surrounding territory.

The winners of the more important contests relating to fruit were as follows: best barrel (McIntosh), D. C. Webster, La Crescent, Minn.; best five boxes (Delicious), Apple Grove Orchards, Mitchellville, Ia.; best single box (Jonathan), E. O. Worth, Mondamin, Ia.; best five bushel basket (Northwestern Greening), William Vetsch, La Crescent, Minn.; best single bushel basket (Rome Beauty), Clarence Bowers, Salem, Ind.; best 10 trays (Grimes Golden), Apple Grove Orchards, Mitchellville, Ia.; best five trays (Delicious), Wilfred Dyer, Cedaredge, Colo.; best single tray (Jonathan), E. O. Worth, Mondamin, Ia.; best five plates (Jonathan), James Withem, Mondamin, Ia.; best single plate (McIntosh), D. C. Webster, La Crescent, Minn. The grand sweepstakes trophy cup in the fruit department was won by the Apple Grove Orchards, Mitchellville, Ia., whose exhibits scored 440½ points. The cup was donated

by the Des Moines Ice and Fuel Company, Des Moines, Ia.

Thirteen states were represented in the entries, as follows: Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Oregon, South Dakota and Wisconsin.

The following officers were elected by the Iowa State Horticultural Society for the coming year: president, C. O. Garrett, Des Moines; vice-president, C. H. True, Edgewood; treasurer, F. O. Harrington, Williamsburg; and secretary, R. S. Herrick, Des Moines. The directors will consist of F. B. Paddock, R. M. Clark, J. S. Wilson, Sr., George A. Schurke, E. M. Sherman, S. W. Snyder, Earl Ferris, D. H. Culver, W. G. DuMont, J. B. Green, Millard Harrington and Mark G. Thornburg.

The Iowa Fruit Growers' Association elected the following officers: president R. M. Clark, Mitchellville; vice-president, George Koth, Des Moines; consulting chemist, Prof. C. N. Kinney, Des Moines; and secretary-treasurer, R. S. Herrick, Des Moines.

The Mid-West Horticultural Exposition is held every two years. The date and place of the next exposition will be decided at the next annual meeting of the Iowa State Horticultural Society.

Nitrates Lost from the Soil During the Winter

LOSS of nitrates from the soil during the winter is shown in a report recently published by the Arkansas Agricultural Experiment Station as Bulletin 205. Data presented indicate that no matter how large a quantity of nitrate may be in the soil in the fall, only a small quantity remains there in the following spring.

The data were gathered in a study of the effect of cultivation on the moisture and the nitrate in the soil of 20 plots of ground that had received different treatment. On October 14

the nitrate content of the soil on the several plots showed considerable variation. The soil on one plot contained 59 pounds of nitrate per acre, whereas that on a plot immediately adjacent contained only 17 pounds of nitrate per acre. On March 27 of the following spring, only 12 pounds of nitrate per acre were found on the plot first mentioned and 11 pounds on the other. Tests made on still other plots showed similar results; that is, the nitrate in the soil in the fall had nearly disappeared by the following spring, and the nitrate content of all plots was then almost uniformly low.

It was suggested that organisms in the soil may have caused the loss of part of the nitrate, although "the leaching effect of the winter rains played a very important part." Attention was called to the value of winter cover crops as a means of reducing this loss of available nitrogen through leaching.

The results of the experiments made show that the available nitrogen applied in one year, even if it may not have been used by the crop because of extremely dry weather during the growing season, is not likely to be available for the next year's crop, for the winter rains will have removed it from the soil. The low content of nitrates found in the soil in the spring also suggests the desirability of having some readily available nitrogen in fertilizers applied to crops in the spring in order to obtain early vigorous growth.—*The Fertilizer Review.*

Johnny Appleseed Prize Awarded

IN THE September issue we announced a prize contest for the best Johnny Appleseed letter. The first prize was won by Elizabeth Newell of Terre Haute, Ind. Twenty-four states were represented in the contest.

The club was established by Walton Holmes Webb of Waverly, Mo., as a memorial to Johnny Appleseed. It has members in all parts of the country and in several foreign countries.

Conference Pear Promising

THE CONFERENCE pear has been giving excellent results at the South Haven (Michigan) Experiment Station, according to an article by Stanley Johnston in the *Michigan Quarterly Bulletin*.

This variety is raised in considerable quantity in England and is quite popular there. Two trees of the variety were planted at South Haven in 1897. Since the trees have begun to bear, they have proved unusually productive, and the fruit is of excellent quality. Favorable reports have been made of it from time to time. The variety was introduced by Thomas Rivers, an English pomologist, in 1894.

The tree is a moderate grower. On the station grounds the trees have set a full crop of fruit year after year. The variety seems to be an exceptionally good pollinizer for Bartlett and several other standard varieties. At South Haven the trees have never blighted, although this does not indicate that the variety is immune to blight. However, the type of growth is rather short and hard, suggesting that it probably has considerable resistance to blight. The fruit is medium to above in size, typically pyriform, although somewhat variable in shape; the skin is shining green, dotted and overlaid in varying amounts with russet; the stem is long and woody; and the flesh is pale yellow with a slight pinkish tinge, melting, very juicy and sweet. The quality is pronounced as very good. The fruit is not quite as attractive as might be desired. If the variety had a golden russet color instead of a greenish russet, it might surpass the Bosc, its nearest rival, in most respects, especially in earliness of bearing and productivity. However, its appearance is as good as or better than that of many other commercial pear varieties.

The harvesting season at South Haven occurs at about the middle of September. The variety ripens a few days ahead of the Bosc. The fruit becomes edible sooner than that of the Bosc, and it will not keep as long, although it may be held for a considerable time in cold storage.

The variety has not been propagated and catalogued by American nurserymen. The experiment station has propagated a few trees for distribution for trial purposes, and now one or two nurseries are propagating it in a limited way. The variety is recommended for home use and for a limited commercial trial.

Injurious Effects of Straw

INJURIOUS effects sometimes follow the plowing under of a heavy coating of fresh straw or other crop growth. As a result, the following crop is stunted in growth in many cases.

Investigators who have looked into this problem believe that the straw serves as an attractive medium for certain kinds of bacteria which multiply rapidly and which use up the nitrogen supply which would ordinarily be used by the growing crops. It has been noted that when nitrogenous fertilizers are applied to the land along with the straw or crop growth, harmful effects to the following crop do not result.

The specialists believe also that such heavy crop growth, when turned under, introduces certain poisonous materials into the soil which affect the tender seedlings of crops which may be planted. This effect is particularly conspicuous in sandy soils. In ordinary soils there is sufficient colloidal material in the soil to counteract these harmful substances.

Investigators at the New York Agricultural Experiment Station are studying the problem in the hope that it may be possible to find a means of safely utilizing straw and other crop growth to supplement the diminishing manure supply. It remains to be seen whether a practicable method of solution of this problem can be found.

MYERS SELF-OILING Power Spray Rigs

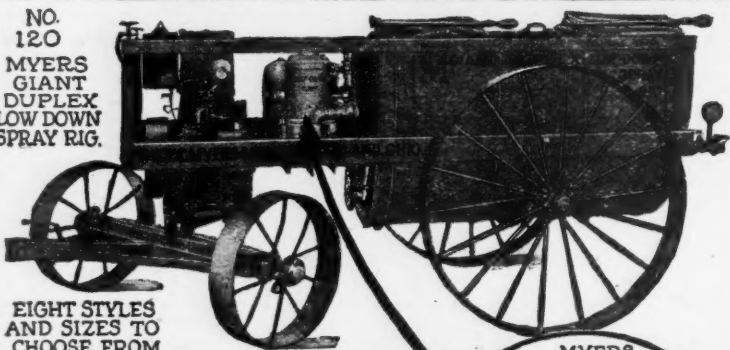
Economy, dependability, performance—these are the qualities on which the splendid success of MYERS SELF-OILING POWER SPRAY PUMPS and complete POWER SPRAY RIGS is built. They are the same qualities uppermost in your own mind when you are spraying or when you are ready to purchase new spraying equipment.

Positive self-lubrication, housed working parts, automatic control, duplex or quadruplex porcelain lined cylinders, other exclusive improvements in design and construction, all so combined and refined as to provide the utmost in spraying perfection, are outstanding features of Myers Self-Oiling Power Pumps, which have influenced so many favorable testimonials from leading fruit growers and farmers throughout the entire country.

If you are particular about your spraying, check your costs and watch your results, you demand the very best of spraying equipment. Then write us today for copy of our new Catalog and ask for information about our complete line of Spray Pumps, Nozzles and Spraying Accessories for every spraying need.

Feel free to address us any time about your spraying problems—there's no obligation on your part.

NO. 120
MYERS
GIANT
DUPLEX
LOW DOWN
SPRAY RIG.



EIGHT STYLES
AND SIZES TO
CHOOSE FROM.

4 POPULAR MYERS HAND SPRAYERS



NO. R 336 B

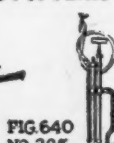


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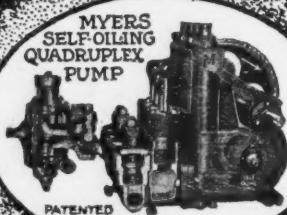


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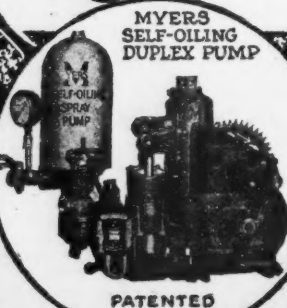
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150 Fourth Street ASHLAND, OHIO.
Manufacturers for over Fifty Years of MYERS' HONOR-BEST PUMPS for Every Purpose.
WATER SYSTEMS—HAY and GRAIN UNLOADING TOOLS—BARN, FACTORY and GARAGE DOOR HANGERS—STORE LADDERS, ETC.



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Coming Horticultural Meetings

ANNUAL MEETING Maryland State Horticultural Society, Baltimore, January 4-5. Secretary, G. R. Cainbey, Silver Springs, Md.

Winter meeting Massachusetts Fruit Growers' Association, Worcester, January 4-6, in co-operation with the annual Union Agricultural meetings. Secretary, W. R. Cole, Amherst, Mass.

Thirty-eighth annual meeting South Dakota State Horticultural Society, Aberdeen, January 4-6. Secretary, N. E. Hansen, South Dakota State College, Brookings, S. D.

Annual meeting Nebraska State Horticultural Society, Lincoln, January 4-7. Secretary, E. H. Hoppert, Lincoln, Neb.

Annual meeting New York State Horticultural Society, Rochester, January 12-14. Secretary, Roy P. McPherson, Le Roy, N. Y.

Annual meeting Rhode Island Fruit Growers' Association, Providence, January 14. Secretary, Richard W. Bowen, Apponaug, R. I.

Annual meeting Tennessee State Horticultural Society, Nashville, January 18-19. Field agent, J. L. Baskin, 405 Morrill Hall, Knoxville, Tenn.

Annual meeting Missouri State Horticultural Society, Columbia, January 19-20, in conjunction with Farmers' Week, January 17-21. Secretary, Paterson Bain, Jr., Columbia, Mo.

Annual meeting Pennsylvania State Horticultural Association, Harrisburg, January 19-20. Secretary, R. E. Atkinson, Wrightstown, Pa.

Winter meeting Montana Horticultural Society, Hamilton. Tentative dates, January 27-29. Secretary, W. E. Pollinger, Corvallis, Mont.

Annual meeting Ohio State Horticultural Society, Columbus, February 1-3. Secretary, F. H. Beach, Ohio State University, Columbus, Ohio.

Winter meeting West Virginia Horticultural Society, Martinsburg, February 10-11. Secretary, H. L. Crane, Morgantown, W. Va.

Eastern meeting New York State Horticultural Society, Poughkeepsie, February 23-25. Secretary, Roy P. McPherson, Le Roy, N. Y.

Chilean Tax on Nitrate to be Retained

NITRATE of soda, which is used in large quantities by American fruit growers, is mined in the mountainous regions of Chile, where rain never falls. The Chilean government has been assessing a tax of \$11.20 per short ton of 2000 pounds on the material since 1897. The tax constitutes over 25 per cent of the price of nitrate delivered alongside of the steamers in Chile. It is reported that 25 to 30 per cent of the annual revenues of the Chilean government comes from nitrate taxes.

Exports of nitrate from Chile have been falling off rapidly since 1913. No doubt the agricultural situation in the United States has been a factor. The building of nitrate manufacturing plants in Europe during the war has also contributed to the reduction in nitrate shipments. The use of other forms of nitrogen, such as ammonium sulphate and calcium nitrate, has also played a part.

A two-week conference was recently held at Santiago, Chile, for the purpose of discussing present and future conditions in the nitrate industry. It seems to be recognized both by the Chilean government and the leaders in the nitrate handling industry that the situation presents some grave difficulties. Representatives from all branches of Chilean business and industry attended the conference. The opinion was voiced by many in attendance, according to reports, that the high tax of the Chilean government was responsible to a large extent for the reduction in nitrate shipments and for the increased use of other forms of nitrogen in consuming countries. Notwithstanding these expressions, the minister of finance announced at the close of the conference that no reduction in the nitrate

tax would be made. He stated further that costs of handling nitrate in Chile and distribution costs in the United States and other countries were greater than they should be.

According to a report recently made by the National Fertilizer Association, nitrate of soda was being offered in the United States during November for January to June delivery at \$52 per short ton ex vessel at ports of arrival. This price was reported to be available to manufacturers, farm organizations and individual farmers. The cost of transportation from the port of arrival and the cost of unloading from the vessel into cars must be added to the above price.

A Good Cold Weather Starter

Now More Dependable than Ever

Probably no single feature of Dodge Brothers Motor Car has been more widely talked about and commended than the power and promptness of the starter.

The new two-unit starting and lighting system now advances Dodge Brothers leadership in this important respect still further.

There are now no moving starter parts when the car is in motion—no starter chain—no noise—no wear. The new starter is even more **DEPENDABLE** than the old, and far simpler and more compact in construction.

Many other major improvements have been added during the past twelve months, all vitally affecting performance and increasing value far beyond the apparent measure of current Dodge Brothers prices.

Special Sedan \$945—De Luxe Sedan \$1075
f. o. b. Detroit

DODGE BROTHERS, INC. DETROIT
DODGE BROTHERS (CANADA) LIMITED
TORONTO, ONTARIO



DODGE BROTHERS

MOTOR CARS

Proposed Changes in Canadian Tariff

THE CANADIAN tariff on fruits has heretofore been applied for 12 months a year. Fruit jobbers and growers of Canada recently recommended to the tariff board a plan which provides for the application of tariff duties only during months when competition will be offered to Canadian products. During other months the Canadian market will be left wide open.

In the schedule which has been proposed, year around protection is to prevail on cherries, cranberries and apples. A year around duty of one

cent a pound on apricots is being requested instead of the one-half cent which has heretofore prevailed.

For other fruits, protection is asked as follows: Peaches, July 15 to October 31, two cents a pound instead of one cent; plums and prunes, July 15 to October 31, one cent instead of one-half cent; strawberries and raspberries, June and July, three cents a pound instead of two cents.

"Tommy, isn't it rather extravagant to eat both butter and jam on your bread at the same time?"

"Oh, no, mother. It's economy. You see the same piece of bread does for both."

Value of Farm Manures in Orcharding

By F. W. Allen
University of California

ONE OF the most outstanding characteristics of western orchards is the fact that they are clean cultivated. After plowing, disking and harrowing in the spring, the soil continues to receive thorough cultivation at frequent intervals throughout the growing season. The purpose of this has been not altogether to prevent a growth of weeds or for mere appearance, but for the purpose of securing and maintaining a dust mulch and conserving moisture. Recent experiments have shown that such practice is not only of little or no benefit but that in many instances it is actually detrimental.

Western soils, while often high in the mineral plant food elements, are generally lacking in organic matter or "humus." Frequent and continuous cultivation throughout the growing season, particularly under the general climatic conditions existing in the great valley of California, has increased the oxidation of this material; the humus has been "burned out." As a result of this, soils which formerly were in good tilth and productive of good crops, have now become hard, baked on the surface, difficult to work and rather impervious to water. The trees, in many instances, have reflected this general condition by poor growth and a manifestation of one or more of the troublesome problems spoken of as physiological diseases. As a remedial measure, some growers immediately think of fertilizers. What kind would give the best results? This is a question almost impossible to answer without actual trial. However, where one has livestock or is so situated that barnyard manure can be secured at a reasonable price, it is suggested that this material be used.

Manures possess two values: a commercial value based upon the percentage of plant food elements which they contain, and what has been termed an agricultural value, or their effects upon the soil as measured by plant growth. The chemical composition of manures shows a rather wide variation, depending upon the animals, their age and food supply, and also upon how the manure is handled. Average analyses show that per ton, barnyard manure contains approximately 10 pounds of nitrogen, five pounds of phosphorus and 10 pounds of potash. Poultry manure, largely used by the apple growers in the Sebastopol section, will, as compared with the above figures, analyze approximately three times as much nitrogen, seven times

as much phosphorus and twice as much potash as stable manures.

The actual analysis of manure, however, is of minor importance to its effects upon the physical condition of the soil. The organic matter which it contains has a wonderful moisture holding capacity—some 200 to 300 per cent of its own weight. Thus when a liberal application of manure is made to trees growing in a very light sandy soil, having a water holding capacity of only six to 10 per cent, it really makes available a much greater amount of moisture in the surface soil by increasing its water-holding capacity. The greater the amount of organic matter which can be incorporated in sandy soils, the less irrigation water is required for the best growth of the trees. Furthermore, the application of organic manures to such soils has a tendency to prevent their drifting or blowing.

Applied to orchards on a heavy soil, the benefits of manures are equally advantageous, or even more so than those on light soils. While the latter are made more compact, the reverse situation is true with the heavier soils. They become lighter and easier to work. The individual soil particles are kept from running together and thus there is less baking of the surface after a rain or irrigation. The larger the proportion of straw in the manure applied, the greater will be the extent to which this will be true. Combining the chemical and physical effects of manure in the soil, it would seem difficult to find a more suitable fertilizer for orchards. While the chemical plant food elements which it contains are not so readily available for the plant's use, as is the case with some commercial fertilizers, it accomplishes the important purpose of adding the limiting element of most soils—humus. In some sections a much more satisfactory cover crop growth—further increasing the organic matter of the soil—is secured following the application of manures.

The rate of application usually depends upon the available supply. Generally speaking, there is no danger of putting on too much. Ten tons per acre, however, every two years is considered a very fair application, although twice that amount will do no harm. Apply in the fall or winter and plow under early the following spring in order that the process of decay may begin before there is a lack of moisture.

Results from Colorado Peach Survey

RESULTS have recently become available following the survey of the peach industry of Colorado conducted by the Colorado Agricultural College and the United States Department of Agriculture.

The estimates were secured on a three-year basis, this length of time being considered necessary to bring an orchard into bearing. In the Palsade area, the trees were set 160 to the acre on land worth \$300 an acre. Clean cultivation was practiced during the three years. A total of 195 man hours and 160 horse hours were required per acre in the three years.

The costs were as follows: labor, \$107; trees and necessary replanting, \$47; spray material, \$4.40; taxes, \$30; water, \$45; interest, \$106; and other costs, \$11, making a total cost of \$351 per acre. Thus, the orchards at the end of the three-year period represented an average investment of \$651 per acre.

At Paonia the trees were set 17½ by 17½ feet on the average, giving 140 trees to the acre. The total cost per acre for the three-year period

amounted to \$312. The land was valued at \$250 per acre. Thus, the total investment at the end of three years was \$562 per acre.

It is possible to reduce these costs to some extent by planting crops between the trees during the first two years.

A New Red Gravenstein

A NEW Gravenstein apple with a solid, dark red color has originated as a bud sport of the parent variety, according to officials of the New York Agricultural Experiment Station. It is like the parent variety except as to color. It is of a deeper red than the Banks Gravenstein, another sport of the Gravenstein.

The station will in the future recommend the Red Gravenstein as the most desirable of the three to plant, according to Prof. U. P. Hedrick. The new sport is reported to have originated with Van Sent V. Whipple of San Juan county, Washington, about 1907 or 1908. The trees grown by the station were obtained from the Washington Nursery Company, Toppenish, Wash. The variety can now be obtained from several nurseries in the Northwest.



**Self Oiling
Yet
No Enclosed
Inaccessible
Parts**

**The New HARDIE
Greater Power-Higher
Pressure-Less Weight**

TODAY Hardie is building the most dependable and powerful sprayer that has ever been produced. The new Hardie sprayers embody the greatest improvements that have ever been made in the industry. These new features include plungers running in long bronze sleeves; valves that are positive in action and yet easily removed; an automatic oiling system that still retains the accessibility for which Hardie sprayers have always been noted; a more powerful engine; silent chain drive, and heavier gears. The Hardie will give you more pressure, and outwear any other sprayer built.

Write for catalog showing 20 sizes and models of sprayers. From \$5.00 to \$1000.00. Pressure up to 650 pounds.

The Hardie Manufacturing Company
Hudson, Michigan

Hardie-Cushman engine gives abundant dependable power. Light, strong Autoplex truck. Dust proof hood when desired. Many other exclusive features.

Branches at: Portland, Ore.,
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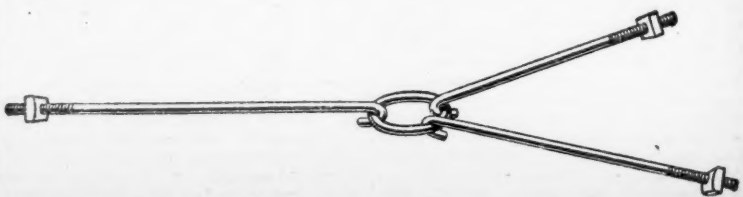
HARDIE
DEPENDABLE
HARDIE
SPRAYERS

New Method of Bracing Fruit Trees

A CLEVER arrangement for bracing fruit trees was described by William Eddington of Excelsior, Minn., in a recent issue of the *Minnesota Horticulturist*. Mr. Eddington states that he had been bracing his apple trees for many years by simply running a rod through two branches. This method had a number of disadvantages, and as a result of these Mr. Eddington developed a new method. He now uses a ring in the center of the tree. Rods radiate from this ring to the various branches, being hooked to the ring by means of an eye. Mr. Eddington first ties together two limbs which will leave the ring in the most central position. Brace rods for the other branches are then added.

The rods are made of three-eighths-inch rod iron. The material costs about two cents a foot. The rods are made in various lengths by the village blacksmith. The rods cost from three to five cents each. The rods for each tree cost about 25 cents on the average. Mr. Eddington has a vise and a three-eighths-inch die and threads the rods himself. He buys the burrs by the pound. The braces are made in the furnace room at spare times during the winter.

Mr. Eddington states that he has used a great many different methods of bracing fruit trees and that the method described has been found most efficient. The method can be used for shade trees as well as fruit trees.



This picture shows how the ring and rods are used for bracing trees

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Concerning Fruit Trade-Marks

By John J. Riley

FRUIT PACKERS using distinctive trade-marks on their products have been put in a very favorable position by a recent ruling of the commissioner of patents. He held that when it was to be decided whether or not there was a probability of confusion in trade due to use of the same brand on fruit and on other foods, the tendency would be to find that such "probability" exists. Especially would this be true if the mark in question was original and fanciful and not a commonly used brand, such as "Gold Medal," "Blue Ribbon," and others of similar nature.

Where such probability of confusion is present, in order to prevent damage to the person first using the mark, the one starting its use at the latest date will be denied his application for registration of it, should he apply. This refusal by the federal authorities to recognize such claim of trade-mark rights, which are later in point of time, should therefore act as a check on the growing practice among persons outside the fruit growing and packing industry of using the popular fruit brands on other food products.

Use of Fruit Brands Denied for Canned Fish

The use of one of the well known fresh fruit brands by another person on canned fish was the cause of the commissioner's decision, objection having been made to the registration of the mark for use on canned fish. The fruit packer, as first user of the particular brand, claimed that use of the same brand on canned fish would be damaging to his business, stating that people would buy the fish believing that they were buying his products. In this way the fish canner would be receiving the benefit of the packer's good will through the confusing use of the same trade-mark.

Believing it so clear that there was no chance of such confusion on the part of the public even though the same brand was used on both products, the canner asked that the opposition be dismissed without requiring him to defend his use of the mark on fish. His contention was, of course, based upon the claim that the difference in the nature of fresh fruits and canned fish made mistakes as to the source of the products impossible, notwithstanding the fact that the identical mark was used on both.

The request was denied by the commissioner of patents on the ground that the difference in the goods was not so clearly shown as to withhold from the fruit packer the opportunity of showing that they were subject to confusion in trade, when the similar brands were used. On the same basis, he held that the canner should not be relieved of presenting evidence supporting the contention that there was no similarity in the products of the respective parties.

Fruit Growers May Expand Into Canning Business

Referring to another case in which it was held that canned fruits and vegetables were of the same class as canned fish, the commissioner decided that the business of fresh fruit and vegetable packing and shipping might very naturally be expanded to cover the canning of the same products. While the fruit growers might not be canning their products at the present time, he recognized the fact that they should be protected by disapproving the use of similar brands on products ordinarily coming within the scope of their business. By analogy to that case, therefore, he held that the use of the same brand at the same time on both fresh fruit and canned fish might lead to confusion in trade.

Although the applicant was denied his request for dismissal of the opposition at this time, when he submits the required evidence supporting his contention that there is no chance of confusion in trade between the goods, there is the possibility that he will prove his point.

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Two sizes, 10-20 h. p. for 2 plows, and 15-30 h. p. for 3 plows. Fully equipped, 4-cylinder tractors, with ample power at belt, drawbar, and power take-off.



Next Spring— Summer, Autumn, Winter—Profit with McCORMICK-DEERING Tractor Power

EVERY YEAR McCormick-Deering Tractors stand stronger with the farmers. The name McCormick-Deering has become the symbol of reliable power farming because it stands for carefully built, practical, many-sided, long-lived farm power.

That is so in your community and everywhere. Men who have used International Harvester tractors—for months or for years—are steadfast friends of McCormick-Deering farm power. They will recommend McCormick-Deering when you come to buy. Other men, who risked using cheaper, lighter tractors, found themselves underpowered. They fell short of reaching full production with the least possible labor and in the

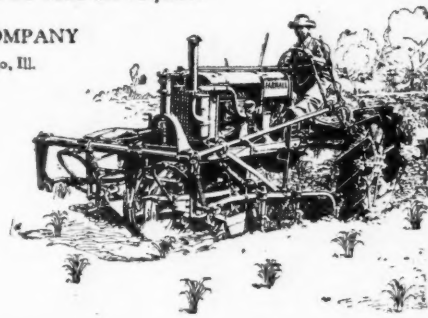
shortest possible time. After this experience they were ready for new and better power. There are thousands like these, too, who will recommend McCormick-Deering when you make your power investment.

McCormick-Deering gives you your choice of three tractors—the McCormick-Deering 10-20, the 15-30, and the new all-purpose row-crop tractor, the FARMALL. All are quality tractors, built to last many years. Any one of them will work for you with drawbar, belt, and power take-off the year around. Any one of them will cut your producing costs and add to your profits. Look them over at the dealer's store. Catalog will be sent on request.

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606 S. Michigan Ave. OF AMERICA (Incorporated) Chicago, Ill.

The FARMALL!

The remarkable new 4-cylinder McCormick-Deering FARMALL, designed to handle cultivating and planting of row crops, as well as all other farm power work.



Most Popular — Most Profitable — Best McCORMICK-DEERING for 1927!

Until that time, however, the decision sets the principle that arbitrary and fanciful fruit brands, made valuable through extensive advertising and personal effort, cannot afterwards be used by canners or packers of other food products without the propriety of such use being subject to serious questioning.

Peach Trees in Georgia Need Spray for Scale

A REPORT is prevalent in some sections of the Georgia peach belt that examinations by this laboratory have shown that practically all of the San Jose scale is dead and that spraying this winter for the control of the insect is not necessary. This erroneous

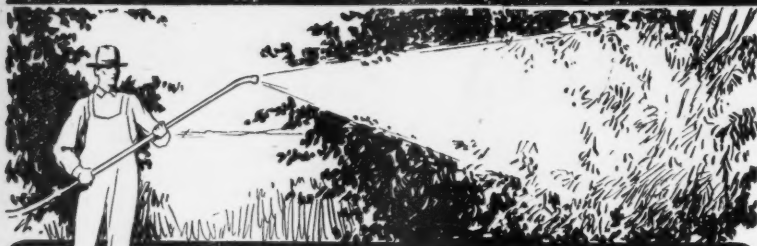
report has evidently resulted from the difficulty we experienced last fall in locating an orchard showing a high percentage (90 per cent or better) of live scale in an incrustated orchard, which is desired for some special oil spraying experiments. Many orchards were examined in a number of localities in the peach belt with the result that practically all of them showed too low a percentage of live scale for these special experiments.

In practically all orchards we found live scale. The percentage in the individual orchards varied from five to 50 per cent. If these orchards are not sprayed this winter, there will be sufficient live scale to cause a heavy infestation by next year with a resultant devitalization of the trees. It is true that the scale mortality has been

heavier than usual during the past summer, probably due to the abundance of the twice-stabbed ladybird beetle, a predacious enemy of the San Jose scale, but in no orchard where scale has been present is this mortality sufficient to warrant the omission of the usual dormant spray. This laboratory strongly urges, as usual, the spraying of peach trees in Georgia this winter for the San Jose scale.

Either lubricating oil emulsion should be used in the proportion of nine gallons of the stock emulsion, containing at least 65 per cent of oil by volume, to 191 gallons of water; or liquid lime-sulphur in the proportion of one part of the concentrate to eight parts of water.—United States Peach Insect Laboratory, Ft. Valley, Ga.

No. 145 ANGLE SPRAY ROD



Saves Spray Material, Time and Money

Shoots Fine Mist Spray Any Distance from Nozzle—Combines Best Features of Spray Gun and Bamboo Rod

You can reach every part of a full grown tree with a fine mist spray and in addition gain the speed and large capacity of a spray gun—with the No. 145 Angle Spray Rod. Combines the best features of all spray apparatus in one easily handled gun.

Light—Easy to Handle

Turned with nozzle pointed up; enables you to reach the under side of the tree, and its extra length makes it possible to use a fog spray where long-distance position would be necessary with the ordinary gun.

Lighter and easier to handle than any other apparatus.

Price \$11.00 Delivered

Sturdily Constructed

5½ feet long with a 40° angle at the nozzle end. Made of 18-gauge brass with all castings and parts of brass. Weighs only 3¼ pounds. Nozzle constructed to break up the spray at the long position when desired, and gives operator positive control of spray mist, enabling him to change the volume as he wishes. Has saved as much as 25% in spray material, decreased labor and increased speed.

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Sent to you by mail, postpaid, satisfaction guaranteed, for only \$11.00. Mail check or money order and gun will be sent at once. Try it for one week and if not thoroughly satisfactory, your money will be returned.

(DEALERS:) Write for special dealer proposition.

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**5½ feet LONG
WEIGHT 3¼ lb.**

YOU can make more money with a Case tractor because you can do more work with it.

It gives you dependable power for any farm job, under every condition of climate soil and weather.

It cuts production costs to the bone, and is adapted to the best farming methods.

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The Editor's Mail Box

Pink Rot and Apple Scab

Editor, AMERICAN FRUIT GROWER MAGAZINE: We have several large apple trees which bear a large amount of apples each year but which always have ugly brown spots on a large percentage of the fruit. We sprayed several times with lime-sulphur and arsenate of lead. We are sending samples of the apples. Will you kindly examine these and advise us regarding them?—F. S. F., Illinois.

ANSWER: The apples that you sent were infected with apple scab and pink rot. The dark gray spots are caused by apple scab, a fungus which commonly develops early in the season while the weather is still fairly cool and damp.

The pinkish spots are caused by a fungus commonly called pink rot. If you will examine some of your apples, you will find that the pink spots partly or wholly surround the grayish scab spots. The pink rot fungus is what is called a saprophyte. It cannot directly attack the living tissues itself. It gains entrance through the dead tissue at the edges of the scab spots. Following its entrance, it seems to indirectly cause the death and discoloration of the tissue surrounding the apple scab spot.

No doubt, the exceptionally wet weather we have had this fall is responsible for your trouble. In ordinary seasons, there is very little difficulty of this kind. Pink rot follows apple scab quite often in storage, but it is less frequent while the apples are still on the outside. It also becomes bad occasionally when the fruit is placed in piles and is allowed to remain outside for some time after picking.

The pink rot can be prevented by spraying the trees thoroughly for scab. You will find no pink rot where there is no scab. Probably the best material to use for scab in your locality is lime-sulphur solution at the rate of one and one-half gallons of 33 degree Baume material to 50 gallons of water. The first application should be made when the flower buds are just beginning to spread in the cluster and before they open. The second application should be made when the bloom has practically all fallen from the tree. The third spray should be made about 10 days to two weeks later. These three sprays, properly applied, will usually keep the apple scab in excellent control.

In addition to practicing a good spray program for scab, I would suggest that you place your fruit in storage immediately after the same is picked. Avoid an excessively moist atmosphere in the storage, and keep the temperature as near the freezing point as possible.

Mulching Strawberries

Editor, AMERICAN FRUIT GROWER MAGAZINE: Please give me directions for mulching strawberries. Should this work be done before the ground freezes or can I delay it until after the ground freezes? I have a great deal of work just now and would prefer to do the mulching after the ground freezes.—J. E. L., Ohio.

ANSWER: It will be better to mulch your strawberries after the ground is frozen than before the ground freezes. The ground should be frozen hard enough to hold up a wagon or truck. Of course, it is not desirable to delay the mulching too long, for winter killing may occur if the weather becomes exceedingly cold or if alternate freezing and thawing takes place. The ground should have no snow or ice on it when the mulch is applied.

Clean wheat straw is probably the best mulching material for strawberries. Oat straw is not so good because it tends to mat down tightly over the plants and to cause more or less smothering. Any other mulching material which does not carry serious weed seeds and which will afford protection without danger of smothering the plants will be suitable.

The mulch should be applied about four inches deep and spread uniformly over the patch. The finer the

mulching material is the thinner it should be applied.

In exposed locations where there is danger of the mulch being blown off the land, it is a good thing to spread cornstalks or other coarse materials over the mulch.

Protection from Rabbits

EDITOR AMERICAN FRUIT GROWER MAGAZINE: Last autumn I used a mixture to keep rabbits from gnawing young apple trees. The trees were close to a thicket, on an adjoining farm. The rabbits began to cut out the trees early in the fall. I applied the paint and out of 3000 trees I found one small place on one tree nibbled during the winter. It is good for borers and scale also, and Peter Rabbit won't take a nibble for 15 months.

Take two pounds sulphur, two pounds yellow ochre, one gill turpentine, one gill linseed oil, one ounce asafetida, four to six eggs, one-half pint wheat flour. Mix with sweet milk. Stir till dissolved, and apply close to the ground with a brush and as high up as you think necessary every 15 months.

This is the cheapest and most effective tree paint I have ever used.—W. H. G., Illinois.

Louis Erb Opposes Bushel Weight Laws

Editor, AMERICAN FRUIT GROWER MAGAZINE: In your paper of April, 1936, page six, you advocated "Repeal Weight Per Bushel Laws," in which I fully agree with you. The law is a nuisance when it comes to fruits and vegetables. I am engaged mainly in growing apples, of which we have in our orchards many different varieties, and they vary greatly in weights—some weigh as little as 40 pounds while others run as high as 50 pounds to the bushel. It all depends on the variety and size of the apples. This is also true of peaches and pears, and so it is hard to please or satisfy buyers coming in from Missouri, Arkansas, Oklahoma, Tennessee and Kansas when they have different standards of weights per bushel. I don't know whether it is true or not, but some of these buyers claim that in their respective states they are required to furnish the exact weights per bushel as specified in the law, but at the same time they don't want to pay any more for apples weighing 50 pounds to the bushel than for those weighing around 40 pounds. As you correctly stated, the weight per bushel laws are obsolete and should be abolished. If you will agitate this matter further and call general attention to it, I believe you will have the support of growers and the trade generally.—Louis Erb, Cedar Gap, Mo.

ANSWER: We agree fully with the viewpoint taken in your letter. We are very much interested in this proposition and desire to promote the same in every way possible. We feel that every horticultural organization of the country and every individual grower should work in the interest of uniform weight laws. It is the laws of the individual states which first need correction. After the discrepancies in the various states have been gotten out of the way, it will be appropriate to pass national legislation on the subject and not until then.

Preserving Cider

Editor, AMERICAN FRUIT GROWER MAGAZINE: I noted your directions in the November issue for preserving grape juice. Can the same method be applied to cider, or is it necessary to use a chemical preservative?

Please also give me information about the legal requirements for the making and selling of cider and vinegar and for the use of preservatives.—W. E. K., Minnesota.

ANSWER: You can use the method described for grape juice in our November issue for cider with certain modifications. The best cider is made from a good grade of apples. The apples should be thoroughly cleaned before crushing. About 160 gallons, and sometimes more, can be obtained from a ton of apples. More juice can be obtained by pressing the pomace a second time, but this is usually of a dark color and of poorer flavor than the cider from the first pressing. The second lot of cider is

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more suited for vinegar than for sweet cider.

The methods given for filtering and clearing grape juice will apply also to cider.

Practically the same methods can be used for pasteurizing and bottling the cider as were described for grape juice. You can keep the cider in lacquered tin cans or in bottles or glass jars. After straining the cider carefully through cheesecloth, heat it in the open cans or bottles to 165 to 175 degrees for 15 to 30 minutes. Then can the cider and seal it at once. Keep the cider at as low a temperature as possible. If you watch the temperature carefully and do not let it go too high, the cider will retain the taste of fresh cider.

You can also preserve the cider satisfactorily by mixing with it one-tenth of one per cent of benzoate of soda. Cider which is so treated must be appropriately branded if it is to be sold.

There is no law which prevents the making of cider and vinegar for home use so far as I am aware. You should not attempt to sell cider after it has begun to ferment, but you are at liberty to sell fresh cider and vinegar at any time.

Propagating Nut Trees

Editor, AMERICAN FRUIT GROWER MAGAZINE: I have an excellent shell bark hickory nut growing on my place, and I want to propagate some more trees like it if possible. Can I get more trees like it by planting the seeds? There was a good crop on during this year, and I have a considerable quantity of the nuts, so can start trees in this way if it is all right. If this method will not work, kindly give me a method that will work, if possible.—K. E. B., Arkansas.

ANSWER: Nut trees are like practically all fruit trees. In other words, they do not come true from seed. If you plant nuts obtained from your tree, you will probably get a wide assortment of varieties. It is quite likely that very few of them, if any, would produce nuts as good as those from your present tree.

The only way you can be sure of getting trees like the one you now have is to propagate new trees by budding or grafting. You can start the trees from the nuts obtained from your good tree or from any other tree. After these seedlings reach sufficient size, you should bud or graft onto them scions or buds obtained from your present tree. The growth made from the scion or bud will produce nuts like those of your present tree.

The same principles of propagation are employed in propagating nut trees as are employed in propagating fruit trees. However, nuts are usually more difficult to propagate than fruits, and special precautions are necessary. It would be a difficult proposition to explain the various methods in detail by letter, and I am therefore going to refer you to Farmers' Bulletin 1501-F, which can be obtained free of charge from the United States Department of Agriculture, Washington, D. C. This bulletin gives detailed directions for the propagation of nut trees, and should be studied by all persons interested in nut tree propagation.

Bitter Pit or Stippen

Editor, AMERICAN FRUIT GROWER MAGAZINE: The McIntosh apples of this vicinity are affected with brown spots in the centers. The disease seems to be getting worse every year, and it seems to be more serious on McIntosh than on any other variety, although it is found in other varieties also. I am sending you a McIntosh apple under separate cover. Will you kindly tell me what causes this trouble and how it can be controlled?—D. M., Canada.

ANSWER: The brown corky spots found on the interior of the apple which you sent are characteristic of the disease called bitter pit or stippen. Some varieties show this difficulty in the form of sunken spots on the surface. In some cases the disease first appears only in the interior of the apples. Later in the season, especially after the apples have been placed in storage, most varieties affected on the interior develop sunken spots on the surface in addition.

Bitter pit is not due to a fungous disease. Apparently it is caused by some physiological disorder. One theory is that the disease is due to excessive transpiration from the fruits, thus leaving the sap in the fruits quite concentrated, which in turn causes death of the cells. Another theory is that the disease is caused by excessive transpiration of moisture from the fruit during warm days, followed by reduced transpiration during the cool nights. The flow of sap continues well into the night because of the warm soil, and an internal pressure is created in the fruits which causes the bursting of some of the cells. A third theory is that the dryness of the soil in some dry seasons prevents a sufficient supply of mineral matter from reaching the fruit, thus causing death of the cells.

The leading authorities seem to agree that the disease in some way is associated with a deficiency of water and that it is related in some way with transpiration. Changeable weather and temperature seem to encourage the disease.

Unfortunately, no definite method of control is known. Authorities recommend that every effort be made to distribute the setting of the crop uniformly all over the trees year after year. Heavy pruning should be avoided, since this upsets the tree and stimulates transpiration. Production on lateral branches should be encouraged, since it has been noted that trees bearing most of their fruit on laterals suffer least from bitter pit. The fruit should be systematically thinned at the right time, as this promotes regular and uniform bearing. Trees bearing thin crops of large apples seem to suffer worse from the disease. Many authorities believe that the growing of more cover crops would help to reduce the damage. Good drainage should be provided. In humid sections the soil should be so handled that it will not become excessively dry during the summer. In irrigated sections long intervals between irrigation should be avoided and an effort should be made to apply the water before the soil becomes very dry. Uniform moisture conditions should be maintained so far as possible. The foliage should be kept healthy by good spraying, as diseased foliage influences the amount of transpiration. The apples should be stored immediately after picking and kept at as near 32 degrees Fahrenheit as possible.

Use Sulphur Fumes for Tent Caterpillars

Editor AMERICAN FRUIT GROWER MAGAZINE: In your November issue, a Nebraska reader tells how he kills tent caterpillars with an oil can and kerosene. No doubt his method will work satisfactorily, but some nests are quite high, and one would need to use a ladder and do considerable climbing and reaching about to get all of them.

I have been using a method which has proved to be very efficient and rapid. I use a pole long enough to reach the highest nests. To the top of this, I fasten a half-gallon or gallon receptacle filled about two-thirds full with ashes mixed with brimstone or sulphur. I place live coals in the pail before putting in the brimstone and ashes. Carrying the pail about the orchard, I hold it under the nests. Quick results follow. The caterpillars succumb rapidly when the sulphur fumes reach them. It is not a good thing to stand directly under the nests, as one would then be covered with worms in a short time. This method, properly used, will kill all the caterpillars and will do no harm to the leaves and branches. The work should be done on a comparatively windless day.—C. H. K., Ohio.

ANSWER: The method which you describe is very interesting indeed and I see no reason why it should not prove efficient in controlling the tent caterpillars. I believe that growers in general will be interested in your method, and I am therefore going to print your letter for the benefit of other growers.

I feel that your paper is a great help to fruit growers. It touches upon important phases of fruit work, the articles are always in season, and all departments are very instructive.—R. A. W., Massachusetts.

Longer PROTECTION -is yours in every pair!

WHEREVER there's mud or slush, you will find Goodrich Rubber Footwear giving its extra service and longer life.

Millions of feet are enjoying that snug, dry comfort which this footwear can bring to you.

And 65,000 dealers make it easy for you to get this protection.

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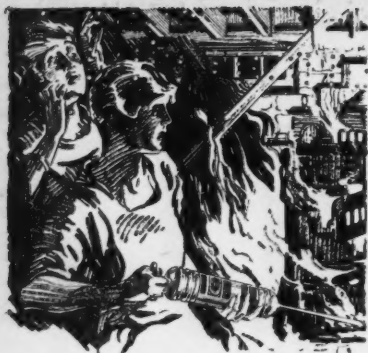
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The first thing to do in buying Zippers is to look at the flap and find the name.

An instant of caution—and months of satisfaction are yours.

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Saves two lives —and a home

HERE is the story exactly as it was told by one of the ladies:

"Suddenly the furnace was covered with flames. It stood between us and our only possible way of escape—a flimsy pair of wooden stairs.

"Just as the flames spread to the side walls, my daughter took the *Pyrene* Fire Extinguisher, pumped the liquid on the flames and almost instantly the fire was out."

It may happen to you tomorrow. Be prepared. "Fortify For Fire Fighting" by putting a *Pyrene* Fire Extinguisher in your home today.



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FIRE
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KILLS FIRE—SAVES LIFE

PYRENE MANUFACTURING CO., Newark, N. J.

Write for free booklet "Safeguarding the Farm against Fire"

Better Trees

WHEN you plant a fruit tree you must cut off one-third to one-half of the top. What you then have left makes the foundation of your orchard.

So we grade and sell our fruit trees by diameter of the trunks.



In November 1926 we shipped to an Arkansas customer 1200 peach trees 9/16 to 11/16 in size after pruning the tops back to two feet. He writes us, "They are the finest trees I ever saw."

Other customers write, "Much nicer than I expected." "I find yours to be a very reliable Company, doing better than the contract calls for."

Send today for free catalog of fruits, roses, shrubs, vines, etc.

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Golden Winesap Apple

The juicy tartness of the Jonathan, and the satisfying meatiness of the old Winesap make a combination that is hard to equal. You will find the Golden Winesap an apple worth growing.

FREE—Get my 1927 Garden Book before you buy any seeds or trees. Make your selection from it and you will be delighted. Write for it today.

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SPRAY YOUR FRUIT TREES AND VINES



Destroy the fungi and worms; be sure of larger yields of perfect fruit.

Stahl's Excelsior Spraying Outfit
Prepared Mixtures

are used in large orchards everywhere; highly endorsed by successful growers for thirty-five years. 20 models, power or hand types. Write for free catalog containing full treatise on spraying fruit and vegetables.

WM. STAHL SPRAYER CO.
Box 74 Quincy, Ill.

Rambles of a Horticulturist

(Continued from page 8)

Nelis 18.1, Anjou four, Bosc 3.6, all others 2.9. The principal plum and prune varieties rank in the following order: Italian, Tragedy, Standard and California Blue. The peaches are very largely of the Elberta, J. H. Hale and Slappey varieties. Tilton



This apple tree, grown from a graft planted last spring by the Washington Nurseries, Toppenish, Wash., will have the appearance of a two-year-old when sold. The whip was headed back in early June, and it then developed the branches shown. The picture was taken on July 3

and Moorepark are the chief varieties of apricots. The cherry varieties consist almost entirely of Bing, Royal Ann, Lambert and Black Republican.

The work of the northwestern growers in reducing the number of fruit varieties and standardization on



Bartlett pear tree braced according to the Caldwell system by Arthur Evans at Yakima

a very few of the best sorts is an outstanding piece of work and should provide food for serious thought on the part of growers in some eastern sections where large numbers of varieties are still being grown.

Try This and Have Gas to Sell

A CERTAIN automobile owner installed a newfangled carburetor that was guaranteed to save 20 per cent in gas. Then he put in special spark plugs to save 20 per cent, and an intake super-heater that was guaranteed to save 20 per cent. He next put in a patented rear axle that was also guaranteed to save 20 per cent, and retired with a new brand of tires that promised a 20 per cent saving in gas consumption. Finally, he drained his crank case and refilled it with a new oil guaranteed to increase his mileage 20 per cent. Now, with a fuel economy of 120 per cent, the owner has to stop every hundred miles and bail out the gas tank to keep it from running over.



With the Co-Ops.

WHILE the fruit growers and farmers in other sections of the country were for the most part losing money, the California Fruit Growers' Exchange handled at a profit to its growers the largest citrus crop in its history. The exchange marketed 46,533 cars or over 20,000,000 boxes of fruits. The delivered value to the wholesale trade was \$97,662,552. The annual returns to exchange members were \$70,744,726. During the last 23 years the exchange has returned to its members \$737,000,000. The losses have amounted to but \$31,950, which is a small fraction of one per cent of the f.o.b. business. The total cost per box of the exchange service was lower than the marketing charge of any other agency marketing perishables, according to the report of E. G. Dezell, general manager. Thanks to efficient distribution, a satisfactory market prevailed throughout the season. This condition is considered all the more remarkable because of the large production of deciduous fruits the past season.

The Valencia orange production has doubled during the last 10 years and is three times greater than 15 years ago. The activity of the exchange in promoting orange juice consumption has helped the Valencia market materially. A total of 33,600 Sunkist juice extractors is now in use. These extractors have assisted in developing a large and growing fresh fruit drink outlet.

The exchange marketed during the past season the largest Valencia orange and lemon crops ever shipped from California. It handled over 90 per cent of the California lemons. The exchange exported to European and trans-Pacific countries more than three times as great a volume as in any previous season. The development of this business is an important factor in the handling of the steadily increasing crops.

More than 3000 cars of unmerchantable lemons were converted into citric acid, lemon oil, citrus pectin and beverage bases by the Exchange Lemon Products Company, a subsidiary of the California Fruit Growers' Exchange. The Orange Products Company, another subsidiary, has grown in membership and capacity during the season and has made record sales of concentrated orange juice and other products. The Fruit Growers' Supply Company, a subsidiary which owns large timber acreages and manufactures lumber and box shoo material, transacted business during the year ending October 31 amounting to \$10,296,390.

IT COST the citrus growers of the Salt River Valley 65 cents a box to sort, grade, pack and market their orange, grapefruit and lemon crops through their co-operative association, the Arizona Citrus Growers' Association, in 1925-26.

Ninety-five per cent of the Salt River Valley citrus growers are represented in the co-operative organization which, during the past year, handled 175,000 boxes of fruit. The packing season extends from September to June.

More than \$500,000 was distributed among the growers, the average price received being six and one-quarter cents, net, a pound for fancy; four and one-half cents, net, a pound for choice; and \$1.60 a box for Navel orange culls and three and one-half cents a pound for grapefruit.

The grapefruit crop during the past

year made up about two-thirds of the total packings, or about 110,000 boxes. Orange packings totaled about 60,000 boxes, and the remaining 5000 boxes were lemons.

The bulk of the valley orange crop is marketed in eastern consuming centers, while the grapefruit distribution is confined largely to the Pacific Coast and domestic markets. Arizona grapefruit always brings a fancy premium on Pacific Coast markets in competition with California fruit.

The Arizona Citrus Growers' Association now operates its own modern daylight packing plant, which has a capacity of about 10 cars a day. This plant represents an investment of about \$150,000. Among its features are automatic fruit-stamping machines.

Present citrus acreage in the Salt River Valley totals about 2500 acres. New acreage is being added as fast as nursery stock becomes available, the present rate of increase being about 500 acres a year.

The Salt River Valley citrus belt is one of the few districts in the United States where fumigation and smudging are unnecessary. With an assured water supply from the Roosevelt project, the growers operate at a minimum of production expense.

THE YAKIMA Fruit Growers' Association developed a new pooling plan for pears this season which has been working out satisfactorily, according to a recent report. The returns to growers were above the top prices paid by independent buyers. The net prices paid to growers, after all costs of wiping, packing, storage and selling were deducted, were \$33 per ton for the first pool, \$20 for the second, \$18 for the third, and \$10 for the fourth.

Pool No. 1 consisted of fruit of the fancy grade two and one-fourth inches or larger in diameter. Pool No. 2 included fruit of the fancy grade smaller than two and one-fourth inches in diameter. Pool No. 3 included C grade fruit two and one-fourth inches or larger in diameter. Pool No. 4 consisted of C grade fruit under two and one-fourth inches in diameter.

Under the new plan the association dealt directly with the canners instead of through brokers. The arrangement was entered into by the canners with some doubt and on a tentative basis only. The plan has proved so satisfactory to the canners that they have asked that the arrangement be made permanent.

Under the new plan one or more brokerage charges has been eliminated in the sale of the fruit.

CHRIS L. CHRISTENSEN, who was recently appointed in charge of the newly created Division of Co-operative Marketing of the United States Department of Agriculture, made the following statement regarding the work of the division at the recent meeting of the National Association of Marketing Officials in Chicago:

"The objectives of the new Division of Co-operative Marketing in the Department of Agriculture are to assist in the development of sound and progressive co-operation; to promote efficient operating practices by the associations, and to disseminate information regarding the principles, practices and possibilities of the movement designed to be of service to co-operative associations and agricultural producers.

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concerned with the study of the development of co-operative marketing of particular commodities. A study of the organization of farmers' elevators in the spring wheat area was begun in 1924 and the completion of this study will probably require five years. A study of the operating practices and costs of cotton gins has been carried on. A survey of the organization and operation of co-operative associations marketing fluid milk is another new project.

"A study covering the whole field of co-operative livestock marketing was begun early in 1926. Other phases of the division's work include a series of business studies of individual co-operative associations, and the legal problems of co-operative associations."

THE SUNLAND Sales Co-operative Association, which handles the sales operations for the Sun-Maid Raisin Growers and the California Peach and Fig Growers' Association, has added prunes to their list of products. The prunes to be handled will not be obtained from the California Prune and Apricot Growers' Association, it is stated. Apparently the prune selling operations of the Sunland Sales Association will be conducted in competition with those of the California Prune and Apricot Growers' Association. It appears that both organizations would be better served by the development of a co-operative sales plan.

THE CALIFORNIA Walnut Growers' Exchange recently reported an achievement which is noteworthy in the history of co-operative marketing. Eighty-three per cent of the walnut tonnage of California was signed up in one month by the exchange without the employment of paid solicitors.

Just previous to the campaign a new legal structure for the exchange was developed. New incorporation papers and by-laws for the central organization were adopted. The by-laws of all locals were uniformly revised. In addition, uniform contracts between the growers and locals and between locals and the exchange were adopted. The success of the campaign indicates the confidence of growers in the new plan, and it is a real victory for co-operative marketing in general.

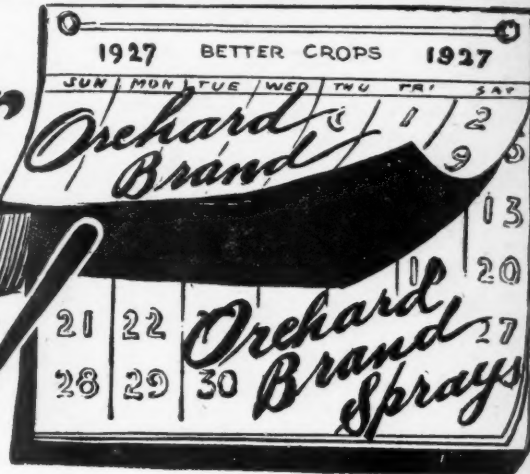
In 1925 the California walnut crop consisted of 57,748,640 pounds of unshelled merchantable nuts and 14,268,592 pounds of culls. The crop was the largest on record. The exchange handled through its 45 local units 48,000,000 pounds of merchantable nuts and 14,000,000 pounds of culls. The estimated sales value was over \$12,000,000. Notwithstanding the large crop and the declining prices as the season advanced, the association expects to have no carry over. The cull nuts were all cracked, and it was expected some time ago that the meats would all be sold by November 1.

Operating expenses for 1925-26 were five per cent of the opening price value. These included 1.75 per cent for advertising, 1.5 per cent for brokerage, one per cent for trade discount, and about 0.75 per cent for salaries and incidental expenses. In addition to the five per cent, an additional 3.5 per cent was deducted from returns made to locals to cover losses resulting from sales made at less than the opening prices.

During the 14 years of operation of the exchange, the quantity of nuts handled has more than tripled, and the percentage of the California crop handled has increased from less than 52 per cent to more than 83 per cent. Beginning with the 1926 crop, the individual nuts of the Diamond brand will all be stamped.

"AN ECONOMIC Study of Berry Farming in Western Washington" is the title of Bulletin 204, of the Washington Agricultural Experiment Station, Pullman, Wash. The authors are Neil W. Johnson and George Severance. The bulletin gives the result of a very careful study of the small fruit industry in the Puyallup and White River Valley districts in western Washington.

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APPLE production in Illinois was well above the average the past season. The quality varied widely, especially in the west central and southern portions of the state. The conditions in the western part of the state were more favorable. Commercial shipments will fall short of expectations due to discouraging prices. Apples colored fairly well and were of good size as a rule, though the size was less uniform than usual.

Because of the long continued fall rains and the lack of control of pests earlier in the season, the proportion of wormy apples and smoky or blemished stock was large. A larger pro-

portion of the apple crop than usual went into storage. Considerable quantities were converted into cider. The total production for the state is estimated at 8,875,000 bushels, compared with 7,000,000 bushels a year ago. The commercial apple crop is estimated at 1,375,000 barrels, compared with 1,164,000 barrels last season and a five-year average of 1,102,000 barrels.

The pear crop, which consisted mostly of Kieffers, was estimated at 774,000 bushels, compared with 510,000 bushels in 1925. The quality was good. The state produced about 6532 tons of grapes in 1926, compared with 3360 tons in 1925.

Markets and Marketing



A NEW terminal for handling perishable products was opened in Philadelphia on November 1. It is called the Philadelphia Perishable Products Terminal. It is to be operated by the Baltimore and Ohio Railroad Company and the Reading Company. The facilities consist of an auction sales building, private sales building and cold storage warehouse, and a team delivery yard. The terminal is located in the heart of Philadelphia and covers approximately 23 acres.

The auction sales building is built of concrete and is 90 feet wide and 1000 feet long, with a concrete platform eight feet wide along the driveway side. The building has floor space for 150 cars, allowing ample aisle space for access to each carload for inspection and delivery. Thermostatically controlled heat will permit handling of the products regardless of weather conditions.

The building is served by three car tracks having a total capacity of 72 cars. A 65-foot concrete driveway has been provided for handling city deliveries. The building is two stories high. On the second floor are two large auction rooms, in which particular attention has been given to acoustics. Space has also been provided in the building for offices for the Philadelphia Auction Company, for the auction company's printing plant, and for the agent who will represent the railroad companies at the terminals.

The private sales building and cold storage warehouse is still under construction and will be ready for operation by February 15. It will be of concrete construction 90 feet wide and 900 feet long. It will also be served by three tracks having a combined capacity of 72 cars. This building is intended for perishables not ordinarily sold at auction and will be heated to permit the handling of traffic under any weather conditions.

The building will be eight stories high at one end. Facilities for refrigerated storage will be provided on seven floors. This will consist of approximately 1,300,000 cubic feet. Rooms of different temperatures will be provided for handling different commodities.

The team delivery yard, another division of the new terminal, will consist of 15 tracks having a total capacity of 360 cars. Between each pair of team tracks is a platform with shelter, the purpose of which is to facilitate inspection and sampling of cars for team track delivery.

A MOVEMENT is growing in the distribution of perishables which no doubt has great significance for the growers of the country. It is developing in connection with the chain store groups, which have grown with tremendous rapidity in recent years.

The Atlantic Commission Company has been formed as a subsidiary of the Atlantic and Pacific Tea Company, which is the largest buyer of fruits and vegetables in the United States. The organization was formed over a year ago. For some little time its activities were confined to receiving consignments in New York. In recent months, however, the organization has extended its activities rapidly and now it has an organization spread over a large part of the country. It has salaried branches in eight or nine markets and it has men located in the northwestern apple district, western New York, the eastern shore of Maryland, Virginia and Delaware, the Maine potato district and other sections.

A considerable number of men con-

nected with the organization were formerly employed by the Federated Fruit and Vegetable Growers, Inc., the tonnage of which has been steadily declining. In view of the experience of these men in the co-operative marketing of perishables, they are in position to make themselves quite serviceable to the organization. It is unfortunate that their efforts must be used in the interest of a private purchasing organization rather than in the interest of the growers of the country. They are, of course, indirectly assisting the growers in finding a market for their products, but it must be recognized that from the price standpoint, they are working in the interest of the Atlantic Commission Company and not in the interest of the growers.

The Atlantic Commission Company is buying products for the Atlantic and Pacific Tea Company, and it is also selling products to the trade in general. This seems to be a rather odd combination, and it will be interesting to follow the development of the organization and note its measure of success. In all probability, the other chain store organizations will be reluctant to buy perishables from the Atlantic Commission Company. On the other hand, we must remember that a number of the large chain store organizations formed a combination about a year ago. The question arises as to whether the operations of the Atlantic Commission Company may not be embraced in the plans of this combination.

R. D. WILLOUGHBY gave a most interesting account at the convention of the Michigan State Horticultural Society of his operations in selling fruits in a roadside market. He was especially employed by the Mountain View Orchards of Romeo, Mich., to sell the large fruit crop of that organization.

The first step consisted in erecting a new sales building of the open front type. This was painted white. New drives were also laid out, and ample parking space was provided.

On the first day of operation, 1500 bushels of peaches and other fruits were sold in this market. Sales of 1020 bushels of Hale peaches at \$4 per bushel were made on another day. On one Sunday, 702 gallons of cider were sold at 50 cents per gallon. During the peach season of 1924, windfall peaches were advertised for sale at 50 cents to \$1 per bushel. On the following Sunday the sales amounted to over \$11,000, and they included many first class peaches as well as all of the windfalls on hand. During the past season the sales of fruit have totaled over 60,000 bushels. Mr. Willoughby has sold numerous products for other growers in the vicinity in addition to the products handled for the Mountain View Orchards.

Mr. Willoughby has obtained the best success with trained retail clerks. He prefers girl clerks.

THE EXTENT to which the automobile truck is being used for marketing perishables is revealed in some statistics recently collected in the eastern shore section of Maryland, Virginia and Delaware.

Last spring, 197,485 crates or 224 carloads of strawberries were moved out of the eastern shore section to New York, Philadelphia, Newark, Jersey City and Baltimore by truck. The shipments by freight and express amounted to 1322 and 582 crates, respectively.

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The cost of hauling by truck varied from 50 to 75 cents per crate to Philadelphia and from 85 cents to \$1 to New York. In connection with these costs, it must be remembered that the drayage charges in the markets were entirely eliminated and that berries picked in the afternoon were hauled during the following night and were on the tables of consumers the next day. Furthermore, hauling by truck reduced the icing charges and obviated needless delays, both of which are extremely important factors in the marketing of perishables.

The trucks began to load at the loading sheds around noon as a rule, and a steady stream of trucks continued to move from that hour until about 7 p. m. During the week of May 25-31, 739 trucks were engaged. During the next week, 915 trucks were in operation. The running time to Philadelphia was from five to seven hours and to New York from 11 to 12 hours.

It is stated that the berries shipped by truck arrived in excellent condition. The volume of berries shipped in this fashion is a testimonial in itself in this connection. The prices received, however, add more weight to the situation. The prices for 32-quart crates varied from \$4.10 to \$6.10. The Missionary variety brought an average return of \$4.53 per crate, the Luptons \$6.03, the Klondykes \$4.85 and the Gandys \$5.68.

H. P. GASTON of Michigan State College presented some interesting information before the Michigan State Horticultural Society as a result of a study of roadside markets made during the past season. He brought out clearly that the best results are secured from roadside markets located on the right side of the road as one enters the city.

He presented averages compiled from a large number of representative markets showing that sales in markets located on the left hand side of the road were about 58.4 per cent of those made in markets located on the right hand side. The sales for each day of the week ranged consistently lower for the market on the left hand side than on the right hand side.

This result seems strange at first, but it is readily explained when one considers the circumstances. Automobiles are more likely to turn off the road on the right side than on the left side, as they do not like to cross the stream of traffic. Furthermore, they are more likely to see signs on the right hand side than on the left

hand side of the road. When people are leaving cities, they are usually in a hurry to get somewhere, and they are not in the mood to buy farm products, except in a small way for eating out of the hand. Consequently, purchases are few and are made in relatively small quantities.

When people are returning to the city they are in a different mood. They are then thinking of the food supply at home, and the thoughts of the wife may turn to canning and preserving. The thoughts of the man probably turn toward the financial saving he can make by buying in a roadside market. They are near home; they are on the right hand side of the road; they see the signs on that side; and they can easily turn off without crossing the stream of traffic on their left. It is easy to understand that city folks are in a distinctly better psychological mood for buying when they are returning to the city than when they are leaving it.

Mr. Gaston also showed that the sales of different products for a considerable number of roadside markets averaged as follows: novelties, 1.1 per cent; lunch, 1.3 per cent; tobacco, 4.6 per cent; candy, 9.4 per cent; soft drinks, 19.7 per cent; and farm products, 63.9 per cent.

THE AMERICAN Trade Commissioner at Rome, Italy, reports that cherries are packed in brine to a large extent in that country. They are also preserved in syrup and in this form are exported to a considerable extent. From 100,000 to 150,000 barrels of cherries are packed in brine annually in Italy and exported chiefly to England, France and the United States. England receives more than any other country, and it also receives from 50,000 to 70,000 cases of cherries preserved in syrup from Italy.

The cherries packed in brine are used in the importing countries for manufacturing purposes and are especially desired by chocolate factories and confectioneries.

Cherries packed in brine are exported from Italy to the United States in casks. The brine solution contains sulphurous acid and kitchen salt, added in such quantities as to make the solution contain about 0.7 per cent of sulphur dioxide and one and one-half per cent of salt. The fresh cherries are first placed in wooden baskets in a closed room, where sulphur is burned for 12 hours. They are then packed in casks and the brine solution is added.

Monthly Market Review

THE FOLLOWING summary of the fruit marketing situation was furnished by the United States Bureau of Agricultural Economics on December 10:

"Early winter found the supply of fruits and vegetables fairly well known. Not so many things happen to upset the market at this time of year and price changes are less extreme. The general range continues rather low as compared with last season. Apples have been dragging along, but were acting a trifle better around the first of the month. Oranges and grapefruit have been doing well when shipments were moderate.

Apples in Steady Position

"The apple situation looks a little better in some ways. Stocks of apples in cold storage in November were less than last season. Evidently the moderate supply of this class of fruit affords a little encouragement for long-time apple holders, although the figures reflected in part the lateness of the apple harvest in the East.

"Holdings in common storage are doubtless heavy, although the same general causes—freezing, wind storms, close grading and lack of demand for low-grade fruit—have played a considerable part east and west in reducing the quantity of stock available for distant market. In the East considerable quantities were reported left in the orchards. No doubt a rather large percentage of the holdings in common storage in certain apple sec-

tions are more or less impaired for long keeping because of the over-ripeness or slight freezing. The estimate of commercial production should not be considered the only measure of available supply, since it shows the crop balance available for sale rather than the quantity that would actually enter into commercial channels.

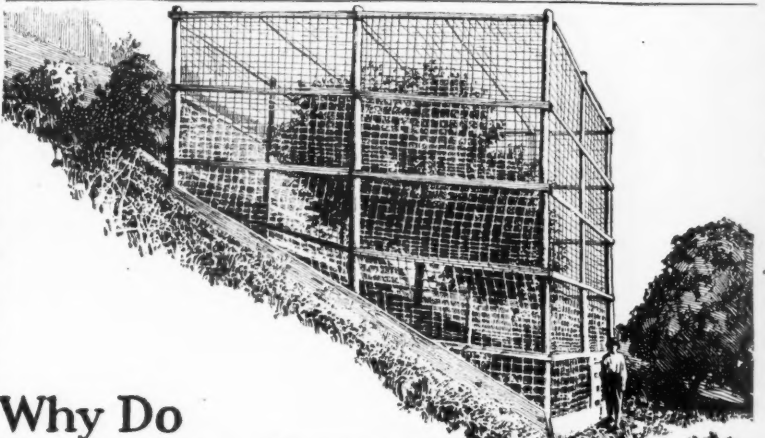
"Early winter finds the apple stocks only about as usual in the Northwest and in cold storage. The region which produced the heaviest crops, the Shenandoah Valley and adjacent sections, has rather limited storage facilities and the crop tends to mature earlier than in more northern localities. Accordingly, shipments usually decrease rapidly about September. The mid-western apple movement also falls off quickly, and production this season was not especially heavy in Michigan, the leading winter shipping state. Production of winter apples in the northeastern apple region seems to have been rather less than for the season preceding. This eastern stock is finding some outlet in the Middle West and in the export trade, as well as in its principal markets near at hand.

"Prices on the whole tended downward until December, but there were a few scattered advances. In the Northwest most varieties except the Winesap, Yellow Newtown and Delicious have declined slowly, but rather persistently. Best stock has been selling around \$1 per box at shipping points, and \$1.50 to \$2.25 in city mar-

kets. Prices of eastern fruit started low and declined a little in early fall, but have shown little change lately. Standard varieties and grades were reported recently at country shipping points at \$2.25-\$3.25 per barrel, and \$2.50-\$4.25 in city markets. Prices of barreled stock have ranged somewhat higher in the Middle West and the South than in the East because of less abundant supplies of good apples from nearby producing sections.

"The active foreign trade continues a strong feature of the apple situation, although November and early

December prices had reached a level about like that of the domestic markets, when allowance is made for differences in cost of marketing. The Greening and the Yellow Newtown often led the others in price at British auction sales. The export movement from the United States and Canada reached about 4,000,000 barrels by December 1 and has continued at a rate which promises one of the greatest export seasons on record, although a heavy volume of sales is likely to be offset by periods of oversupply, with low prices."



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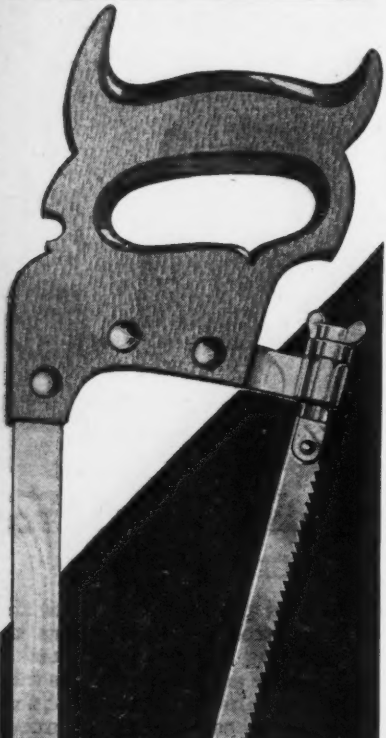
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Book Review

A Riddle Within a Riddle

"SOLVING the Farm Riddle" is the title of a new book written by Edward Jerome Dies, author of "The Wheat Pit." The book has no index, and the table of contents gives only the subjects of the 10 chapters. The book consists of 147 pages in large type and sells for \$1.50. The publisher is Pascal Covici, Chicago.

In view of the publicity issued about this book, we expected to see something worth while, but we were sorely disappointed. The book starts with ridicule of various attempts which have been made to organize co-operative associations. Great stress is laid on the failure of certain co-operatives. Corresponding prominence is by no means given to the numerous successful co-operatives in existence. No mention is made of the fact that failures, large and small, occur about as frequently in business and industry as in co-operative marketing.

The book comments in a vague and general way on the various plans which have been offered for the solution of agricultural problems. The author makes light of most of these plans. He is reluctantly forced, apparently, to reach the conclusion that co-operative marketing, properly conducted, perhaps may prove beneficial. While he does not say so in so many words, he certainly leaves the impression that co-operative marketing is attended with many pitfalls and that growers should go into it very cautiously. In his opinion, no one, not even the government, should give vigorous encouragement to co-operative marketing. Anyone who would vigorously promote co-operative marketing should be considered a dangerous citizen. We wonder if the author really wants co-operative marketing to develop normally, or if it was his desire to outline a method of procedure for it which, if followed, would result in its getting nowhere.

The author seems to have given more attention to the invention of plays on words than to the presentation of facts in an orderly, convincing fashion. Perhaps it was impos-

sible to develop much order out of such a chaos of subject material. We were unable, after reading the book, to decide whether the author is sincere in his attitude toward agriculture or whether he has no understanding of it. After reading the book we felt very much like the Indian who, after hearing a political speech, made the following comment: "Big clouds, lots of wind, much thunder and lightning, no rain."

Irrigation Pumps and Pumping

A WELL illustrated booklet on irrigation pumps and pumping has recently been issued by the De Laval Steam Turbine Company of New Trenton, N. J. The booklet describes irrigation projects in operation in the fruit sections of Oregon, including those in the Grants Pass district where water is pumped for nearly 20,000 acres. The pamphlet also presents data on the selection of pumps adapted for individual requirements as well as information pertaining to pump characteristics, pipe friction, speed and horsepower calculations. The information is presented in a readable fashion so that it can be used by the average intelligent farmer and fruit grower. Copies may be obtained on request.

Chemistry in Agriculture

"CHEMISTRY in Agriculture" is the title of a new 384-page book written by J. S. Chamberlain of the Massachusetts Agricultural College. The book is non-technical in character. It takes up a large number of practical problems from an economic standpoint and explains the principles involved in a simple manner that can be readily understood by the average reader. The book will prove interesting and valuable reading to fruit growers and farmers. It can be secured from the Chemical Foundation, 85 Beaver Street, New York, at a cost of \$1.

Plum Propagation

By W. H. Alderman
University of Minnesota

PROBABLY the best plum stock for use in Minnesota is that arising from the native plums of the state. Seed of either the wild plums or cultivated varieties of the native plums are equally satisfactory. Sandcherry seed is used sometimes and makes a fairly satisfactory rootstock, especially for some of the small sandcherry hybrids. It is not believed by most propagators, however, that it is so satisfactory when used with the larger growing plums. Frequently pits of the cultivated hybrid plums are used for stock, but these are not so satisfactory as the native sort for they do not produce seedlings, nor would they, theoretically, be as uniformly hardy as the native fruits. Seeds of the Canadian plum, *prunus nigra*, of which there are several cultivated varieties, make exceptionally good stock.

The handling of the pits and the growing of seedlings is a simple matter. The fruit is gathered in the fall and the pits extracted. They can be secured in a small way by crushing the fruit or grinding it in a cider mill, allowing it to decay for a few days, and then washing vigorously with water, the pits settling to the bottom and the pulp rising to the top. After the pits have been removed, they should be stratified at once in sand. They are usually placed in boxes or tubs, with alternate layers of sand and pits. They are kept moist and usually stored in a cool place until freezing weather is at hand. Here the practice differs, some propagators

plunging the boxes or tubs of stratified seed into the soil and allowing them to freeze throughout the winter. Other growers report that they are equally successful when they hold the stratified seeds in a cool cellar and do not freeze them at all. In any event, it shows that the plum is easy to grow. In the spring the pits are sifted from the sand and planted in rows four feet apart. This should be done as early as the soil can be worked satisfactorily. They are planted about three inches deep. In a few weeks the seedlings will show sprouts above the ground and will make ordinarily a very vigorous growth if kept well cultivated. Some nurserymen plant the pits rather thinly in the rows so that the seedlings will not be crowded and then bud them during the latter half of August of the year in which they are planted. If the trees have made a good growth, and if the soil in which they are grown is not too sandy, this plan is a fairly satisfactory method of handling them. In a light soil, however, it frequently happens that the trees will not form strong, bushy root systems without having first been transplanted and the ordinary seedling root cut back during the operation. The majority of growers probably dig the seedlings at the end of the first season, store them in a cellar and either root graft them during the winter or line them out again in the spring in nursery rows to be budded the following August. The practice of root grafting in the winter time is declining. This practice involves the

use of a section of root four to six inches in length, in the end of which is inserted a scion of the variety which it is desired to propagate. The union between root and scion is wrapped in waxed string or waxed paper, the completed grafts tied in bundles and stored away in damp sand or sawdust in a cool cellar. It sometimes happens that plum root grafts make a poor start and not over 50 or 75 per cent live. It is for this reason that budding, is coming more and more into favor. A root graft must stand for two years in the nursery row before it is a marketable tree. If the plum seedling is planted in the same spring in which the root graft is planted, it may be budded the following August and in the succeeding year will produce a marketable tree fully as strong, or even larger, than the root-grafted tree.

It is a characteristic of these hybrid plums that for the most part they make an enormously vigorous growth in the nursery row. I have seen these trees one year from the bud measure 11 feet in height and one and one-half inches in diameter. So rank is their growth that it is unnecessary, and in fact very unwise, to allow them to stay in the nursery row until they are two years old from the bud.

Quail Must Have Cover and Food

ATTRACTIVE and suitable cover, sufficient and proper food supply, protection from vermin—these three requisites, if provided, will insure a continuing supply of quail in any locality where climatic conditions permit, and allow a reasonable amount of annual shooting.

Quail are so prolific, producing at least one and often two clutches of from 10 to 24 eggs each per year, that there can be no question of their increase and abundance when given suitable cover, food and protection.

Lack of any of the three requisites, however, is fatal. Farms so intensively cultivated and pastured that there is no cover can have no quail. Cover, be it ever so attractive, without suitable food, will be equally barren, and what doth it profit an ambitious pair of bob-whites to produce one or more clutches of fertile eggs, and, maybe, hatch out large families of lusty young birds if they are to be devoured by rats, snakes, skunks, crows, hawks, cats and dogs?

"The losses caused by vermin are even greater than those due to climate, since they occur every day and every night during every year. They are especially active during the nesting season when they feed their young on game. The destruction at this season is wholesale, since the loss of a parent bird means the loss of a bevy."

"Foxes and hawks are the more familiar enemies, but crows destroy thousands of eggs and young birds, while owls, minks, wolves, bob-cats, skunks, snakes and other furred and feathered vermin destroy more game during this time than is taken by guns in open season."

Many clubs and landowners of the southern states are putting this knowledge to use and, as a result, are building up splendid stocks of quail on their lands, from which surrounding lands also benefit.—*The American Game Protective Association.*

Meeting of Washington Horticultural Association Held at Wenatchee

THE TWENTY-SECOND annual meeting of the Washington Horticultural Association was held at Wenatchee December 24. All previous attendance records were broken and numerous new members were secured.

The chief topics discussed were spray residues, oil sprays, fruit maturity and marketing. O. T. Clawson of Wenatchee is the new president. He succeeds Luke Powell of Yakima.

Spur Pruning

By R. H. Roberts

University of Wisconsin

THE QUESTION is often asked if it pays to do spur pruning on older bearing trees. The answer is probably this: It depends.

The writer pointed out from time to time that not all kinds of wood bear fruit equally well. It is not common for fine apples to be produced on weakly growing spurs or branches which have poor foliage. Because of this fact, the writer advises that the principal aim when pruning older bearing trees should be to remove such weak wood as does not bear good fruit. Ridding the tree of poor wood is accomplished either by rejuvenation or removal.

Weak Spurs Pull Down Average

If the principle of securing more uniform and better fruit by getting more uniform growth is followed to its logical conclusion, weak, non-productive spurs should also be pruned off. There is a tendency to leave some undesirable wood on the trees because "it bears some fruit." This is, however, not the only thing which this wood does. It pulls down the average performance of the whole tree. That is, good branches do not bear as well when the tree has many weak branches as they do when the tree has more uniformly vegetative growths. The large production of fine fruit from middle-aged to young bearing trees appears to be due to the fact that it is in this period that there is relatively little poor, weak wood, and much good, strong wood, on the trees.

There appears to be relatively little chance to rejuvenate or invigorate very weak spurs. If heavy pruning is done so that a change in light and nutrient conditions causes the weak spurs to grow better, then the stronger ones send out long shoots or "sucker" growths. If the branches upon which the weak spurs are grown are headed back, only the spurs close to the cut make much response. The tendency in this direction is shown in the accompanying illustration. When heavy fertilizing is practiced, the principal response is made by the stronger growths. Even when the

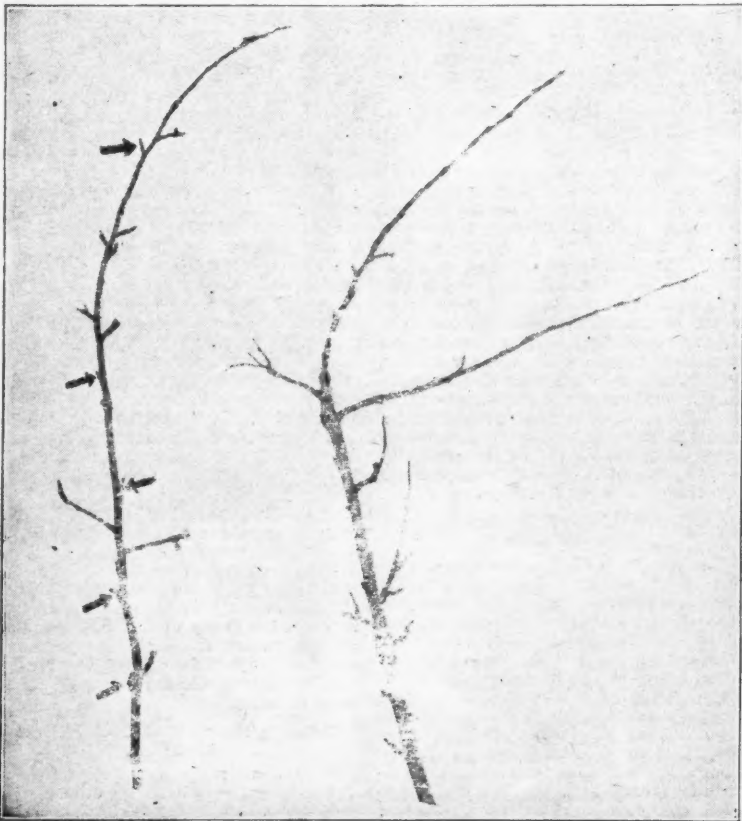
stronger spurs are forced into excessive growth, the weakest spurs show very little response. Clearly, it is not practical to try to rejuvenate weak spurs by soil fertilization. Because of these conditions, the reasonable way to eliminate weak spurs is to cut or break them off.

Practical Demonstration of Spur Pruning

The Simpson Orchard Company of Vincennes, Ind., demonstrated in the summer of 1926 that spur pruning may be a very practical and beneficial operation. Medium aged trees of thriftily growing Duchess were pruned. These trees were well above the average in condition and vigor, still they had many weak spurs common to this variety. The pruning was not done with shears but by the much more rapid method of breaking off the undesirable spurs with the fingers. Such spurs are brash and brittle and snap off very readily, leaving wounds which appear to heal quite as readily as pruning wounds. Most of the weak spurs removed were on the under sides of the branches. In this case, the work was done late in the spring. The spurs which were producing small leaves and blossoms were the ones broken off.

The clearly apparent results of removing the weak spurs were a much better foliage and fruit development, more efficient spraying and more uniform size and quality of fruit. The expense involved was no more than that which should be expended on thinning of the fruit. This method does not give a "pruned up" appearance of the branches, but merely gives a well and properly distributed fruiting surface.

Spur pruning, or spur thinning, as it perhaps may be named more properly, should not be attempted unless it is really needed. It is a special operation which may prove to be of much value under some conditions and with some varieties. Whether or not the practice should be employed by a grower will depend on the conditions prevailing in his orchard.



Many varieties of apples bear weak spurs on the older branches. The arrows indicate weak spurs on the branch at the left. Cutting back encourages desirable growths close to the cut only, as shown by the branch at the right. Breaking off of the weakest spurs often materially improves the character of the fruit

Read This Convincing Letter!

Thousands of letters like these are proof of the greater service Cletrac can render you!

Irvine, Calif.
August 12, 1926.

"My 'K' Cletrac, last season and this, has taken care of 50 acres of trees for me without a cent's expense other than for gas and oil. The lower wheels—sprockets—motor—etc., have not been touched.

The Cletrac Snap Oiling System is one of the biggest time savers ever incorporated in a tractor. Not only does this system save time, but it gives positive lubrication to all the lower track wheels while the tractor is in operation.

This "K" Cletrac was worked approximately 1,080 hours and from the present appearance of the tracks, I fully expect to get four or five years more wear out of them.

Your service has always been 100% and you may refer any prospective purchaser of a tractor to me."

(Signed) RAY LAMBERT.

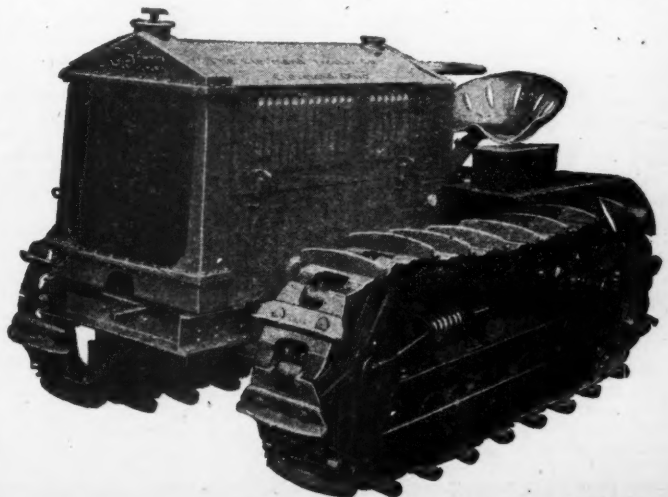
CLETRAC is beyond question the supreme tractor value on the market today—a tractor that fully meets the requirements of the farmer, orchardist and ranchman. Its great power and endurance—its moderate price—its low operating cost—its unequalled ability to travel over any footing, up steep grades and along hillsides—are features that give Cletrac an undisputed advantage.

Ample Power for the Heaviest Hauling Jobs — Sure Traction Over Any Footing—Short Turning and Easy Control for Work in Close Quarters — Instantaneous, Plunger System of Lubrication.

No single detail that could contribute in any way to efficiency has been overlooked in the design or construction of the Cletrac. It is literally a power giant—ready every day in the year to do every big or small power job around the farm, orchard or ranch.

If you are looking for a power plant that will profitably replace horse and man power, cut operating expenses and give you years of hard, heavy service, **investigate the Cletrac.** Three models—"W", 12-20 h.p.—"K", 15-25 h.p.—"A", 30-45 h.p. See one of the Cletrac distributors listed below or write for full particulars.

The Cleveland Tractor Co., Cleveland, Ohio



SPEED WAGON



Cutting Hauling Costs on the Farm

Which costs less—a Speed Wagon loaded to its generous capacity and with maximum ease maintaining maximum speed to your markets and home again? Or an overloaded light truck banging over the roads, risking damage to load and truck, wasting costly hours in slow traveling?

Which costs less—the thousands of easy trips to market, the years of efficient service, the low depreciation, moderate upkeep, and constant reliability of the Speed Wagon? Or the heavy depreciation, the steady charges for maintenance, the loss and bother of layups, the short life of the too-light truck?

CHASSIS PRICES
at Lansing

6-Cylinder 4-Cylinder
\$1240 \$1090

Heavy Duty
\$1985

Last year 49% of the Speed Wagons sold to farmers were purchased by former owners of too-light trucks, by men who had learned the answer to the question "Which Costs Less?"

Consult your Speed Wagon dealer about your own hauling problems.

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REO MOTOR CAR COMPANY, Lansing, Michigan

Spreaders and Codling Moth

CODLING MOTH larvae seek rough places on the surface of apples in preparation for their entrance, according to Prof. R. H. Smith of Leland Stanford University. Because of this fact, there is a tendency for the worms to enter at the edge of spots of insecticides, especially at the lower sides of such spots where the poison deposit is thickest. Prof. Smith has observed that the thicker the poison deposits the greater is the tendency of the worms to enter at the edges.

The question raised in this connection has an important relation to the use of spreaders and the breaking of the spray into a fine mist. There is more uncovered space on an apple receiving a mist spray than on one covered with coarse deposits. Prof. Smith found that in the case of the film coverage the codling moth burrowed directly through the poisoned film. The worms dig through the skin

and do not eat their way through. However, a few particles are sometimes accidentally devoured and through this means some worms swallow enough poison to kill them.

According to Prof. Smith, spreaders have failed to control codling moth to the degree that was expected because they spread the poison out in too thin a film.

BLASTING CAPS look like pretty playthings to children, but every year about 500 boys and girls, as well as some older folks, are injured by tampering with them. They explode with enough force to do considerable damage. The best thing for boys and girls to do is to leave them entirely alone. Older folks should keep them away from the children, and they should exercise great care in using them themselves. An electric blasting cap recently placed on the market is somewhat safer to use than the ordinary caps, but even this kind should be handled with care.

The Grape Deal in the United States

(Continued from page 10)

of the grape districts in New York, and there are possibly 7000 acres in this section. In Chautauqua county, at least 95 per cent of the acreage is of the Concord variety, with some Niagaras, Wordens, Delawares and Moore's Early. About 50 per cent of the grapes in the Central Lakes region are Catawbas, 40 per cent Concord and the balance miscellaneous varieties. Concord, Delaware and Niagara predominate along the Hudson.

Grape production in Ohio and Pennsylvania is merely an extension of the grape plantings of New York, and is centered in a narrow strip of land along the southern shore of Lake Erie, and in Ohio centering in the islands about Sandusky. Concord, Delaware and Catawbas are the principal varieties, forming about 90 per cent of the plantings.

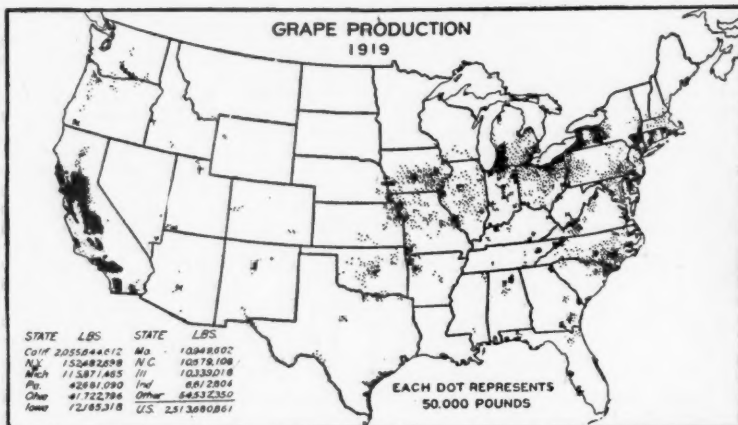
Michigan ranks third among the grape producing states of the Union. The acreage is centered very largely in Van Buren and Berrien counties in the southern part of the state, bordering on Lake Michigan. About 80 per cent of the bearing vines of the state

most unlimited confusion in many respects.

Grape Clearing House Plan

It is little wonder, then, that in the face of another disastrous crop year now closing, where prices have been for the most part below cost of production, that a concerted movement is now under way in California looking toward a co-ordination of the various grape shipping interests with a view of supplying the requirements of all the markets of the United States and Canada in proportion to their consuming capacity, and avoiding the disastrous gluts which have prevailed in years past. It is probably safe to say that the so-called "grape clearing house plan" now under contemplation in California, involving the co-ordination of the interests of all of the large important grape shipping factors, is probably the most far reaching and significant plan of distribution of a perishable commodity that has ever been put forward in the United States.

Secretary of Commerce Herbert Hoover, at a recent meeting of the



Location of important grape producing sections as shown by the census of 1919

are in these two counties. The grape industry of Michigan is of rather recent development, practically all of the commercial plantings having been made after 1900. The Concord constitutes over 90 per cent of the total acreage in the state.

The economic problems involved in the marketing of grapes, not only from California, but from all other states in which the production is of any consequence, have occupied the major part of attention in this field of endeavor rather than problems associated with actual field production. Under the present system of marketing and distribution in vogue in the United States, it would appear that if the country had an over-production on any commodity, it has over-production as a virtual fact in the grape industry. In addition, the shipment of large quantities of so-called juice varieties has presented problems peculiar to the grape industry, as distinguished from the handling of other perishable commodities through regular channels of trade.

Distribution of California's Grape Crop

An analysis of the distribution of the California grape crop in 1925, for instance, shows that of the total carlot movement in that year from the state, approximating 75,000 cars, over 40,000 were actually unloaded in but 11 cities of the United States, and of these 40,000 cars, over 35,000 were actually unloaded in but seven cities. The net result spelled glutted markets and virtual disaster for the fruit grower. With this tremendous congestion of grapes in a few highly specialized markets located in the great areas of population, has come year after year a series of railroad embargoes, restrictions, and regulations limiting the disposal of the product to such a marked degree as to cause al-

shippers of California, assembled in Los Angeles, sounded the keynote in a plan looking for a more even distribution of the California grape crop, a crop which has congested terminal markets for the past three or four years to the exclusion of other commodities, and which has carried with it in its marketing program an effect on the entire marketing structure of the nation.

At the present writing, a serious attempt is being made to co-ordinate the various shipping interests of California, and, in fact, a number of these interests have already gotten together and are distributing what remains of the California grape crop through a clearing house plan of action. The so-called clearing house has in it elements which are applicable to other perishable carlot movements in other sections of the country. It does not involve a monopolistic control of any one or more commodities by one or even two shipping organizations. It simply contemplates a plan under which all of the various factors in the grape deal operating through their respective sales managers allocate the total carlot movement to the markets of the country, based on their approximate consuming capacity. Each shipper, a party to the clearing house, receives his share of the total number of cars going into each market based on the proportion of the total crop which that particular shipping company handles.

Clearing House Plan Should Help Situation

It is confidently expected that the development of a clearing house plan will go a long way toward solving what many have claimed to be an over-production of grapes, not only in California, but in other producing areas. The grape problem, in its production and distribution angles, offers

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many interesting considerations. It is complex and highly specialized in character. Problems of grading, packing and standardization, not to mention improvements in production methods, are so extensive that any adequate description would occupy many volumes.

The carlot shipments of grapes from California alone are in excess of the total shipments of citrus fruits, and are considerably larger than the production and shipment of any other

perishable commodity in the state. It is little wonder, then, that the very prosperity of the state itself is tied up with the solution of some of the major problems involved in the handling of this immense tonnage. The solution of these problems will exert a general beneficial effect which will be felt in every producing area of the nation and will undoubtedly have a stabilizing influence over the large consuming markets of the United States and Canada.

Michigan Society and A. P. S. Hold Joint Meeting

THE MICHIGAN State Horticultural Society and the American Pomological Society held their annual meetings jointly at Grand Rapids, Mich., on November 30 to December 3, inclusive. There was a large attendance of growers, most of whom were from Michigan. The program was filled with addresses on important subjects handled by some of the ablest authorities in the country. Particular interest was manifested in addresses and discussions relating to marketing, of which there were a large number on the program.

The meeting was held in the Panti-lind Hotel, and the exhibits of fruit and of materials and equipment were staged in the Fine Arts Building, which is located only a few doors away. There was a large and varied display of fruit. Numerous manufacturers showed their products, and much interest was exhibited in these displays.

Various phases of western orcharding were discussed by H. M. Peck, J. H. Gourley and William Melkle, the latter a grower from Wenatchee, Wash. R. G. Phillips, secretary of the International Apple Shippers' Association, spoke on better packing of apples. A round table discussion on orchard management was taken part in by Arlie L. Hopkins, George Friday, J. P. Munson, John Keeney, R. L. Everts and H. A. Cardinell.

Dr. V. R. Gardner, head of the Department of Horticulture of Michigan State College, presented the results obtained from a very practical investigation of the variety situation in Michigan and of factors which make orcharding profitable or unprofitable. His results were based on studies of 100 typical orchards, the shipping records of eight fruit co-operatives for five years and the handling of 1,000,000 bushels of apples of 133 varieties. He recommended the growing of a comparatively few varieties and of selecting the location and soil very carefully for new orchards.

Ralph W. Rees presented an excellent summary of the trend of apple planting in the United States. An entire session was given over to cherry culture. R. H. Pettit talked on cherry maggot control. H. B. Tukey of New York showed how dusting of cherries had prolonged the marketing season in the Hudson Valley. A. J. Rogers, recognized as one of the best growers in Michigan, gave results of his experience in cherry growing, including deductions drawn from records extending over 16 years. D. E. Bingham of Sturgeon Bay, Wis., discussed the culture of cherries.

M. H. Willis of the Willis Advertising Agency, St. Joseph, Mich., took the viewpoint that the holding of an apple blossom week helped the Michigan growers in popularizing Michigan fruit. The campaign of Apples for Health, Inc., was explained in a talk given by John W. Gorby, secretary.

Addresses on various phases of marketing were given by R. D. Willoughby, Charles L. Barker, L. A. Boyd, G. E. Praeter, W. F. Rofkar and H. P. Gaston.

A talk on arsenical injury to peach trees was given by C. W. Bennet. L. C. Gentner outlined the peach moth situation and gave recommendations designed to assist the Michigan growers in delaying entrance of the pest into the state. F. P. Cullinan of Indiana described the growing peach industry of his state. Robert Ander-

son gave a moving picture lecture on gassing the peach borer. Prof. U. P. Hedrick of New York gave a very interesting address in which he described horticulture in Europe as observed during his trip the past summer.

The following officers were elected by the Michigan State Horticultural Society: president H. S. Newton, Hart; treasurer, J. Pomeroy Munson, Grand Rapids; and secretary, H. D. Hootman, East Lansing. The executive board will consist of Granger Whitney, R. L. Everts, R. J. Coryell, Carl E. Buskirk, H. J. Lurkins and Minard Farley. The new vice-president will be selected at the spring meeting in South Haven, March 2-3.

The American Pomological Society elected Ralph W. Rees of New York as president, J. C. Blair of Illinois as vice-president, W. T. Macoun of Ottawa, Canada, as second vice-president, and H. C. C. Miles of Connecticut, as secretary-treasurer. The executive committee will consist of C. A. Bingham, M. J. Dorsey, Luke Powell, W. S. Brown, Roy E. Marshall, H. D. Simpson, H. B. Tukey, A. J. Farley, C. D. Matthews, R. A. Van Meter and Paul Stark. The board of managers will be H. B. Tukey, C. A. Bingham and H. D. Simpson.

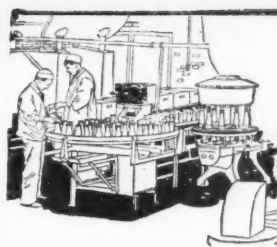
Silver Wilder medals were presented to the New York Agricultural Experiment Station for its collection of seedlings of known parentage; to the New Jersey Agricultural Experiment Station for its collection of peach seedlings of known parentage; and to the Stark Bros. Nurseries for the Starking apple.

The student judging contest was won by the Ohio team, with a score of 95.4 per cent. Teams from Kansas, West Virginia, Michigan and Massachusetts followed with 94.3, 90, 83.2 and 81.3 per cent, respectively. The highest individual rank was obtained by H. F. Winter of the Ohio team, who scored 99 per cent. Other high scores were G. R. Starcher (West Virginia), 96.9 per cent; R. E. Yoder (Ohio), 96.4 per cent; and C. R. Bradley (Kansas), 95.9 per cent.

Surface Drainage Removes Soil and Fertility

SURFACE drainage waters cost the farmers of the United States more than \$200,000,000 every year. In the rich top soil that is washed away, about 126 billion pounds of plant food material are lost. This is 20 times the amount permanently removed by cropping. It is estimated that the surface of the Mississippi Valley is lowered one foot every 5000 years by surface washing. The sediment carried into the Gulf of Mexico annually by the Mississippi River equals a block of soil a mile square and 268 feet high. Surface washing ordinarily carries away the richest soil, leaving in many instances infertile material that is very difficult to till. Erosion is constantly removing the top soil, which is the richest land on the farms. In one instance in Missouri it was found that seven inches of top soil were removed in 24 years by sheet washing from a gently sloping field of Putnam silt loam planted to corn.

One county in the Piedmont region was found by survey to contain 90,000 acres of land formerly productive but now permanently ruined by erosion. Another county in the Atlantic



The producer of milk will now have available the same clean power, as the manufacturer of dairy products has long used.



Rural electrification —a matter of business cooperation

ALL FARMERS want to enjoy the comforts and convenience of electricity. How to get it is the question still to be answered by most of them. Yet rural electrification is merely a problem of business cooperation.

Electric service cannot be sold to isolated or occasional customers, as merchandise can. For electricity—like milk—cannot be stored to any practical degree; it must be consumed as produced.

Thus the cost of building transmission and distribution lines, and of keeping a supply of power ready for instant use, can only be met by having on every mile of line a sufficient number of

consumers whose needs for electricity are many and varied.

That is the principal condition which governs complete rural electrification.

Lines can be built where groups of farmers will use enough power to make the extension of service a practical business undertaking, just as maintaining a milk route requires customers, not widely scattered, who use a steady supply.

So, to get electricity for your farm, get together with your neighbors and make your light and power company a cooperative business proposition. Ask your power company for information and cooperation.

The Committee on Relation of Electricity to Agriculture is composed of economists and engineers representing the U. S. Depts. of Agriculture, Commerce and the Interior, Amer. Farm Bureau Federation, National Grange, Amer. Society of Agricultural Engineers, Individual Plant Manufacturers, General Federation of Women's Clubs, American Home Economics Ass'n., National Ass'n. of Farm Equipment Manufacturers, and the National Electric Light Association.

NATIONAL ELECTRIC LIGHT ASSOCIATION

29 West 39th Street, New York, N. Y.

coastal plain has 60,000 acres of formerly rich land gullied beyond repair. Probably 10,000,000 acres of land in the United States formerly cultivated have been destroyed by surface washing. Much of this land could have been saved by timely terracing.

THE FLORIDA Citrus Exchange is perfecting plans to market grapefruit in European markets. S. B.

Moomaw of London will handle the shipments. The exchange board has decided to guarantee its exporting members against possible loss by arranging to pay them on the basis of the New York auction price at date of shipment for the same grades and sizes.

The sum of \$21,000 will be spent in advertising Sealdsweet grapefruit among European consumers. Boxes, labels and paper will be uniformly standardized.

Built for Orchard Work

Clark Tractor Orchard Plow

You can now cultivate your orchard close to the trees without damage to the low-hanging branches.

For the Clark "Cutaway" Tractor Orchard Plow, built especially for this kind of work, is equipped with a galvanized sheet iron guard, curved to gently lift the branches over the machine without injury.

And because it can be worked close to the trees it quickly levels and pulverizes the ridges that have been built up through years of plowing.

The picture shows the disks pulling the soil away from the trees, but the gangs can be reversed to throw it toward the trees.



Front view

Plows and Harrows in One Operation



Rear view

The Clark "Cutaway" Tractor Orchard Plow is ideal for breaking old, hard sod. And as it will disk in a cover crop without requiring harrowing afterwards it saves time, labor and money. The disks are forged sharp—an exclusive Cutaway Harrow feature which

prevents cracking, bending or chipping.

Send for further information about this machine and free book, "The Soil and Its Tillage." A postal will do.

The Cutaway Harrow Co.

130 Main Street

Higganum, Conn.

Citrus Culture in Florida and California

(Continued from page 3)

The effects of the differences in the moisture factor as it relates to growth and fruit characters and to orchard management and cultural practices are exceedingly marked and of much importance. It is probably not too much to say that the moisture factor is the major one determining the character and quality of the fruit in the two states and the production methods used by the growers.

Soil Differences

Another primary factor influencing the response of the trees and the cultural practices in the two states is the marked differences in the soils. The Florida citrus soils are prevailingly very light in texture and low both in potential fertility and content of organic matter. On account of the heavy summer rainfall, they are subject to excessive leaching, and in addition, many of them require drainage either to remove surface water during flood periods or to lower the water table.

California soils, on the other hand, are prevailingly much heavier, although the variation in texture is somewhat greater. Citrus orchards are planted on soils which range from coarse sands to exceedingly heavy clays. California soils are, in general, high in fertility, they are relatively well supplied with organic matter, they are not subject to leaching except during the very short winter rainy season, and all of them require irrigation.

Contrasts in Cultural Practices

The interplay of these two sets of markedly different factors has resulted in the employment in the two states of cultural practices so dissimilar in many respects as to be almost exactly opposite. In fact, the growers in each state have difficulty in understanding the methods used in the other—even to the degree that many of them have concluded that no general principles can be outlined for successful citrus fruit production. Some of the major differences in cultural practices and operations are as follows: In California, citrus trees are usually planted in early summer, but in Florida the best season is either late fall or early spring. Methods of planting employed in the two states are quite different. In many parts of Florida the principal problem is to avoid excessive moisture, which is accomplished by planting the trees on ridges or mounds. In

California, they must be planted on grades suitable for irrigation.

Methods of providing frost protection for young trees are entirely different in the two states. In Florida, mounding of the soil well up over the bud unions is a universal practice; this method is practicable there on account of the relatively dry winters and the light soils. In California, wrapping of the trunks with corn-stalks is regarded as a much safer method.

Irrigation is universal in California, but on account of the heavy summer rainfall, it is rarely practiced in Florida. Where used in Florida, it is regarded merely as insurance against possible drought.

Insect and Disease Control

In Florida, pruning is practiced almost altogether as a means of disease control and is confined to removing the dead wood which harbors the causative fungi. The open habit of growth of the trees is such that they do not require pruning to admit light. In California, the principal object of pruning is to relieve density of growth.

In California, on account of the dry air, diseases are confined to the trunks and roots, while in Florida the most serious diseases affect the fruit and foliage and require treatment if clean, attractive fruit is to be produced. In the absence of treatment, the amount of the crop is not reduced, although the salability of the fruit is decreased.

Natural control of the most important insect pests through the action of predatory insects and parasitic fungi is quite effective in most parts of Florida. In California, the grower cannot afford to rely on natural control and must employ artificial insect control measures. These are provided either by fumigation or spraying. If the insect pests are not kept under control, the amount of the crop the succeeding season is materially reduced. In Florida, artificial insect control, where practiced, is accomplished almost altogether by spraying, and if the pests are not controlled, reduction of the succeeding crop is not experienced, although the salability of the fruit is decreased.

Fertilization and Cultivation

In Florida, fertilization consists principally in the use of complete concentrate fertilizers, which are ap-

plied two or three times a year. The application of large quantities of bulky organic materials, which constitutes the basis of the fertilizer program used by the California growers, is likely to produce a disease known as die-back. In California, the use of such materials is almost universal and never results in anything but the most favorable response.

In Florida, comparatively little cultivation is practiced, as there is plenty of moisture for both weeds and trees, the soils do not pack, and the rain carries the fertilizers down to the roots. In California, a moderate amount of cultivation is necessary in order to conserve moisture by destroying the weeds, to incorporate fertilizers into the soil, and in many cases to keep the soil in condition to absorb irrigation water.

Character of Groves and Fruit

In general, the appearance of a good citrus grove in Florida is remarkably different from that of a first class orchard in California. Not only is the appearance of the orchards different and the cultural practices markedly dissimilar, but the character of the fruits is also markedly different.

Florida oranges and grapefruit are typically of paler color than the California fruits and usually less free from scale insects and blemishes caused by insect injury or disease. On the other hand, in general they have thinner and smoother rinds and are somewhat juicier. The flavor differs also, being sweet rather than sprightly. The rinds of all Florida grapefruit and oranges, with the exception of the Kid-glove types, are removed with difficulty, and the segments can hardly be separated without crushing.

California citrus fruits are brighter in color, freer from scale and blemishes and more attractive in appearance. The rind is usually somewhat thicker and not quite so smooth. The flavor is somewhat sharper and perhaps richer. The ease of peeling and eating of the California fruit constitutes a striking difference between the two. As to which is the better, it is impossible to say, for tastes differ, as do politics and religion. It is probably a very fortunate thing that the characteristics of the citrus fruits produced by the two states are so distinctive and different, for certainly between the two states all tastes can be satisfied.

Fundamentals Similar in Both States

One of the principal objects of the writer's survey was to determine if there are certain essential requirements which are equally applicable in Florida and California. It was anticipated that the specific details of the cultural practices might and probably would differ, but it was hoped that an interpretation of these might emphasize certain general requirements which are more or less well recognized in California and which furnish the basis for the teaching and extension work conducted by the College of Agriculture.

Given good trees to start with, a soil free from serious chemical and physical defects, and a climatic environment reasonably well adapted to citrus fruit culture, without which success is obviously impossible, these requirements are soil moisture control, maintenance of soil fertility, insect pest control, protection against unfavorable environmental influences (chiefly frost and wind) and disease control.

In California these are important in the relative order as given. It will be observed that certain practices widely employed by growers are not included in this list, such as cultivation, pruning, cover-cropping and others. These are not regarded as primary requirements, however, since they are not always needed. Moreover, when employed by the growers they are merely means to an end—cultivation for the purpose of assisting in moisture control and incorporating fertilizers in the soil; pruning as a means of regulating or re-establishing a desirable nutritional relation in the trees; and cover-cropping

as an assistance in fertilization.

The same general requirements were observed in Florida, though the methods used in providing them were found to be vastly different, and the relative order of their importance also was found different. There the maintenance of soil fertility is of paramount importance, followed by disease control, insect pest control, moisture regulation (which in most cases means drainage) and frost protection. There, too, cultivation, pruning, and cover-cropping are supplementary practices employed for satisfying one or more of the primary requirements.

Conclusion

It is the writer's belief, therefore, that while the climatic and soil conditions, and the cultural and orchard management practices are markedly different in the two states, and each is pre-eminently successful as a citrus fruit producing region, yet the primary problems confronted by the growers in the two states are essentially the same. The recognition of this fact is of the greatest importance in directing attention away from the many perplexing non-essential details to the relatively few cardinal requirements of successful citrus fruit production.

Some Interesting Facts About Apples

(Continued from page 9)

tify further observations. About a dozen bear apples which have fair size, good color and quality and which bloom as late as or later than Genet. It is possible that from this little group will come at least two or three varieties which will be of good color, attractive in appearance, productive, resistant to disease and late enough in blooming habit to escape late spring frosts and freezes.

The Maryland and Minnesota experiment stations have produced several promising new sorts of apples, but none has as yet been recommended for commercial planting.

The best example of a commercial apple which has resulted from premeditated breeding is Ontario, which has some reputation in western New York. The Ontario was produced by an amateur. It has been the purpose of the plant breeder to improve the apple along the lines of size, quality, productiveness, hardness, keeping quality and the like. In such work, it seems logical that open pollination of the varieties approaching the desired qualities might give as good results as controlled pollination.

Whims of Producers Change

The whims or desires of producers have changed many times. In the beginning, the grower may have wished for an apple of better flavor and texture. Later, however, as apples began to be produced commercially, he began to think very little about quality and more about quantity. He was interested, therefore, in the size of the individual specimens and in their handling, shipping and keeping qualities. As a result, we have such varieties as Ben Davis.

The tendency at present, however, is toward apples of higher quality, such as Jonathan, Grimes, Delicious, etc. As to what the next whim will be no one knows, but perhaps better quality will be expected.

Parasite of Gypsy Moth Appears Promising

THE DEPARTMENT of Agriculture has recently introduced into the United States a parasite of the gypsy moth which is particularly promising. This insect is called *Compsilura concinnata* Meigen. It lives on about 100 host insects. It has now been studied for eight years by experts of the Department of Agriculture, and these authorities feel that the insect will prove of great benefit. It will not only check the spread of insects of the kinds it was intended to control, but it has also shown ability to combat other dangerous insects in this country.

Remodeling Unsatisfactory Fruit Trees

By F. C. Sears

Massachusetts Agricultural Experiment Station

MOST of our orchards contain altogether too many defective trees—trees built on the wrong principle or on no principle whatever. Even our modern orchards, developed since we thought we had given the matter some careful study, are often woefully disappointing in the type of trees they contain.

The most common and serious defect is the bunching together of all the main branches in a space on the

years or more, usually the only thing to do is to make the best of a bad situation. About the only thing we can do in such cases is to strengthen the trees with bolts and chains if possible and let it go at that.

But with younger trees it is often possible to remodel them and in a comparatively few years change them into relatively strong and acceptable trees.

Begin operations by developing a



Results like this usually follow a system of pruning which bunches together the scaffold branches of the tree

trunk scarcely long enough to carry one or two branches securely. This particular weakness is largely the result of the craze for extreme low heads in orchard trees which prevailed 10 to 20 years ago, when we cut off the young tree in the nursery or orchard at anywhere from 12 to 30 inches and let it develop its head as best it could. Often three to eight branches were attached to a space of not over a foot. The natural result was that as these branches increased in thickness they crowded each other more and more, till something had to give way and one or more of them broke down under some particularly heavy crop of fruit.

Now what shall we do about it? With trees that are fairly old, 15

leader in the tree if possible. Some branch may already be growing fairly upright, and this may be encouraged to take the lead by heading back its competitors. Frequently, there are already one or more good side branches on this leader which may be developed, by similar checking of their competitors, into new scaffold branches, far enough apart to allow a good strong attachment to the leader. Then gradually remove the old rosette of scaffold branches at the base of the tree, saving one or two of those which are strongest and best located. Do not be alarmed because all this raises the head of the tree considerably. You may have thought that four to six feet was a high-headed tree, and perhaps it is, but go out into almost any good old orchard and you will find plenty of trees that are headed at six feet or over which are not extremely tall.

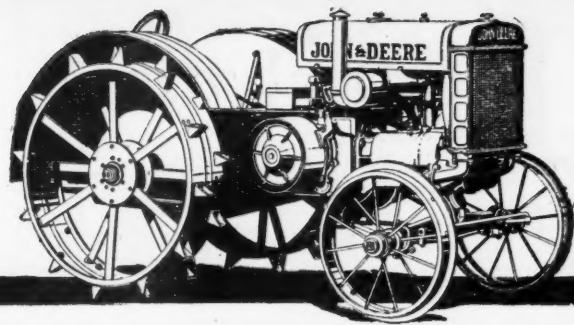
Preserving Posts from Rotting

By Floyd A. Meek

WASTE crank case oil removed from the crank case of automobiles and tractors is valuable for a number of purposes and should never be thrown away. One of its most valuable uses is the preservation of posts from rotting when set in the ground. The worst feature of wood posts is their tendency to rot at the surface of the ground, due to excessive moisture there, but if they are dipped into a container of old oil for a few hours or over night before being set and allowed to soak, they will become soaked with the oil and will not absorb moisture, and their life will be greatly prolonged. Also the oil may be painted on with a paint brush, and one or more applications will greatly increase the service obtained from any wooden object subjected to the effects of being buried in the ground. This is the same principle used by the railroad companies in treating their ties before using.



A young tree with a good framework but too many branches. Several of the branches should be removed



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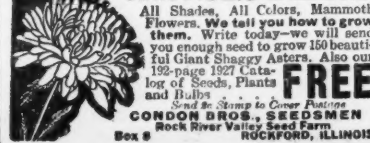


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The Orchard Home Department

By Mary Lee Adams

Fires from Faulty Flues

A GLORIOUS breezy autumn day. Shining noon in the quaint little mountain settlement I am visiting. Villagers and visitors alike seated peacefully at the mid-day meal.

Then the single toll of a bell, scarcely noticeable above that rustling breeze, yet in an instant the whole place is galvanized into frantic activity.

FIRE! FIRE! FIRE! Out into the village square they pour, leaving spoons standing in coffee cups and chairs overturned in confusion.

Men rush to start the fire engine and to man the hose car. Women drag out the chemical extinguishers and help load them onto the truck. Within a minute not a man is left in the place. All have dashed away into the swaying woods.

Even pleasure seeking week-enders from the city spring without question to the aid of the fire-fighters. For this is California at the close of the long rainless season, and the blaze is in a group of buildings standing well within the fringe of the dense, tinder-dry forest.

Who can hold the flames against this fanning wind? Already a roof has fallen in! Half an hour later, grimy, grinning, breathless but triumphant, the ragged brigade returns.

A defective flue. Flimsy lathe and plaster construction. The fire well under way before discovered. Too bad for the owner, his house just a few months old, but what an escape for the townspeople and for the wooded area stretching for miles and miles about them.

For how many destructive fires are defective flues responsible? It would be enlightening to know. Home builders, whatever else they may neglect, should watch construction at this point with the utmost care. Safety of the dwelling, perhaps of the family in it, depends upon adequate protection afforded by properly constructed flues.

A Fine Sight

ONE OF the things you can't help noticing as you drive over California is that every wayside village boasts at least one handsome building that stands out distinctively from the rest. In towns of any size, these buildings assume the architectural proportions of veritable palaces. In larger cities, they become numerous and are, almost without exception, beautiful.

They are the public schools of this progressive state. People who can build schools like these are a forward looking people. They are concerned with the rising generation. Children cannot fail to be impressed with the importance of education when they see such beautiful and costly provision made for housing its activities.

I do not know just how California ranks today in scholarship. Its future in that respect seems assured. Certainly there can be no excuse for illiteracy where every hamlet, even in the high mountains, has a good-looking and commodious school house, and where the school bus collects the children for miles around the adjoining country.

One Hundred Per Cent Kitchens

HOUSEWIVES are cheered by the scientist's prediction of a 100 per cent mechanical kitchen. Such an easily conducted culinary department would allow much more time to be devoted to other features that enter into the 100 per cent home that is the ideal of most women. It would mean an immense increase in efficiency for the individual housekeeper.

We are glad to reflect that workers in the home may thus escape being completely outdistanced by the so-called industrial workers. The United States Department of Labor has com-

piled some very interesting figures showing that, since 1914, the labor output per man has increased in the various industries all the way from 106 per cent to 325 per cent.

This has, of course, been made possible only through increased and improved mechanical contrivances. President Coolidge credits the present prosperity of the nation as a whole to this increased efficiency.

Women ought eagerly to avail themselves of every fresh aid that the skill of inventors brings within their reach. Every year adds to the number of these. The 100 per cent mechanical kitchen, if not yet fully arrived, is on the way.

Chickens, so far as we know, must still be hand-plucked, and peas must be hulled by deft fingers. Yet already there are dish-washers, breadmixers, slicers, cleaners and a host of contrivances that take much of the drudgery from kitchen work. They should appear in the kitchens of many more orchard homes.

The race of man has passed through many ages: the stone age—the iron age—the bronze age. Now we heartily welcome the mechanical age, most wonderful, most helpful to women.

Women and Investments

AN ORCHARD woman I met recently has lost her little all through a worthless investment. She failed to consult beforehand some well qualified, trustworthy authority. Her example may serve as a warning to others, so I pass it along to you.

Every so often we hear of some confiding woman who has been swindled out of her money by a glib salesman. The investment was so attractive. Everything seemed all right according to his representations. But they happened to be misrepresentations.

Women in private life can seldom pass sound judgment on investments. As a rule, they are not well posted on stocks and bonds. Before purchasing any stocks, bonds or real estate mortgages, you should invariably submit the proposition to your banker. He is ready and prepared to give you good advice. It is well to abide by his judgment.

Even the average fruit grower, though more conversant with business than his wife, seldom possesses expert knowledge of financial affairs. His mode of life is not conducive to the acquirement of this kind of knowledge. He, too, would be wise to seek reliable advice before making investments.

Five Wishes of Men

At 10 years—Gee! Wish I was old enough to sit up as late as I like at night.

At 20—Wish the evenings were long enough for a fellow to get through half the fun that's going on.

At 30—Wish I could lie in bed as late as I chose in the morning.

At 40—Wish I could stay at home tonight. My dear, are you really bent on going to that stupid affair this evening?

At 50 (retired from business)—Ho hum! Wish there was something to do around the house. Women are lucky. They can always sew.

IT'S a poor sign these days when a woman sits down to lengthen her skirts. You may depend upon it that something has happened to depress her. She feels "low in her mind." She's in the mood to suspect that she is not so young as she once was. Wait till the clouds roll by and watch her turn up that hem again.

The conversation of some people resembles the world before creation. It is without form and void.

"Po'ly, Thank Gawd"

HERE'S to the New Year 1927, and to the happiest and healthiest year you've ever had. If you're thoroughly healthy, you're pretty nearly bound to feel happy. Let our slogan this year be—KEEP WELL—even if it means some self denial and effort.

Anyone who has lived in contact with the old-fashioned southern darkies knows that few of them can ever be beguiled into acknowledging that they are quite well. Your friendly inquiry, "And how are you?" elicits a groan over mis'try "in de haid" or "de j'int's."

"Po'ly, t'ank Gawd," is as far as the pious are inclined to go, though this occasionally yields to the somewhat grudging admission that they are "Middlin' through mercy." Beyond this they will not demean themselves by joining the rude ranks of the healthy. To be without ache or pain would be to lose caste and to become entirely uninteresting.

Primitive man seems to enjoy the distinction attaching to disease. Little puffy-jawed Penrod collects pocket money from all who crave the privilege of "feeling his mumps" at the expense of one penny per touch.

We smile at such childish simplicity. We realize the wholesome beauty of perfect health. When asked how we feel, we reply, "Simply great," or "just fine, thank you." But then, of course, we have the advantage of education and culture.

Reveling in Misery

However, speaking of operations is a pastime not unknown in the very best circles, and surely the gloating delight of the narrator almost outweighs the unfeigned boredom of the listener. Such talk may not do much real harm, for the operation is over and done with, and for most of us it will be a long time before we can afford the luxury of another.

But the discussion of symptoms is a truly bad habit. A sensitive creature, like myself for instance, can leave a chatty social gathering sorely perplexed as to whether she's headed for sleeping sickness or jungle fever, and distressfully certain of only one dread fact, that she's surely "in for something."

It takes a strong character indeed, when Mrs. Jones dilates upon the anguish of her headaches, not to silence her with an even more lurid picture of the agony of our own toothache. It is beyond patience the way that woman assumes that no one but herself has plumbed the depths of suffering.

Playing the Martyr

Deep down in most of us is a fondness for playing the martyr. Being entirely conscientious, we must persuade ourselves that we do truly have awful times. If our neighbor never closes an eye until after midnight, we can't recapture a comfortable superiority until we say, "I never so much as winked until after three!" Some of us unconsciously keep ourselves awake listening for that stroke of the clock.

It's a sound practice on the part of wakeful people to make a rule never to speak of what kind of night has been passed. Everyone loves sympathy, and often the inclination is to earn it at the expense of lying awake.

Alas! It is usually labor lost. As soon as your back is turned, someone is bound to say, "She sleeps a great deal more than she imagines." And the worst of it (from the sufferer's point of view) is that this diagnosis is probably correct.

On the Other Hand

No doubt it's unwholesome to think or talk too much about our health. "Listening in" for symptoms can create them, at least mentally, and the resulting depression and anxiety

lay one open to actual illness. On the other hand, it is worse than foolish to ignore genuine pain, or to submit to it unnecessarily.

I've a perfectly darling old friend who suffers considerable pain, much of which might be avoided and most of which could be alleviated. Though she does not put it into words, she does way down in her heart believe that the good Lord sent the pain and that it is her duty to bear it uncomplainingly.

She accepts it as a lesson sent to teach her patience, endurance and a lot of fine old-fashioned virtues. We love and respect her for these qualities, but we think she's all wrong about the mission of pain. It's our idea that it has another more direct and practical purpose than to teach us endurance.

"The Loud Alarm Bell"

A modern physician speaks of pain as nature's fire alarm bell calling attention to the spark of illness which at first may be easily controlled, but neglected, may burst into a consuming conflagration. Friendly pains are these if we receive their warning wisely.

It is no more sensible to stifle them with pain-killing drugs than for the ostrich to stick his head in the sand when he wants to hide. Making ourselves insensible to a pain does by no means always touch the cause. We've simply silenced the warning voice—for a time.

It does not need a doctor to tell us that many pain killers are worse than the trouble they seek to cure. What are called habit-forming drugs lead to certain and intense misery. Persistent pains that do not yield to natural simple methods, such as rest, wholesome food, hot applications, etc., call for the advice of a good doctor.

A Stitch in Time

His task is far less difficult when the trouble has not been allowed to run on too long. Skillful as they are, the best physicians may be balked by a malady of long standing which, in its early stages, could readily have been checked.

Most of us fare happily when our time and minds are so well occupied that we have no temptation to brood over imaginary aches and pains. Sometimes it is troublesome for the doctor, or even for the patient, to distinguish between real and imaginary or nervous pains.

A good test, in case you are doubtful as to how genuine an indisposition may be, is to propose to the invalid that he should do something which you know he particularly enjoys. If he feels unequal to the effort involved, you can be sure he's really sick. It's a rather difficult test to apply to one's self, but it works splendidly, particularly with children. Most of us can at any time feel too ill to do what we really dislike, and I've seen children who can turn pale and look weak all over when told to set about some hated task.

Give the Doctor a Show

Keeping in mind the desirability of health, the genuine attractiveness of it, the comfort and usefulness and joy of being well, promotes a healthy state of mind. But before the warning note of pain has settled into a loud alarm, give the doctor a fair chance.

To judge by the way we act, they seem far more interested in making and keeping us well than we ourselves are. No class of men strives more earnestly to discover and utilize the secrets of nature. Think what we owe them for what they have already accomplished in practically conquering the former plagues of yellow fever and smallpox, and in vastly reducing the ravages of tuberculosis.

KEEP WELL if you can. If you can't do it unaided, go to the best doctor you can find. This is the safest recipe I know for a Happy New Year.

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Training and Pruning Apple Trees

(Continued from page 5)

pruned and cut back. Cutting back young trees has delayed the formation of fruit spurs and, consequently, has delayed early fruiting. Table 2 shows the comparative value of light and heavy pruning in relation to early productiveness.

Table 3 shows the comparative value of light and heavy pruning on productiveness in eight-year-old Wine-sap trees.

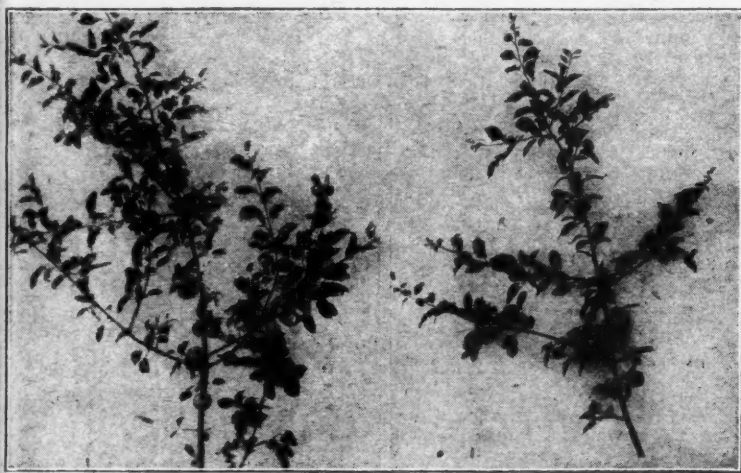
From the standpoint of function, the most important problem in pruning young apple trees is to handle them in such a manner that they will come into bearing early. Young trees make a vigorous growth and consequently have a high nitrogen and low carbohydrate relation within the plant. Heavy pruning and cutting back delay blossom bud formation in these trees by promoting vigorous annual growth and producing a dense tree in which there is much shading of the inner

balanced thinning throughout the trees. If the trees are very weak, this thinning should be distributed over several years rather than doing it all in any one year.

Pruning Old Trees

In the life of nearly every orchard, there is a period when the trees lose their vigor and apparently come to a standstill as regards annual growth and fruitfulness. This condition comes on gradually, the wood growth becoming less and yields being reduced each year. The wide-awake orchardist should watch for signs of waning vigor in his trees and act before they become weakened.

Pruning is not the only remedy for this condition but it is an important part of the remedy. With these trees, growth and vigor must be promoted, and in some cases excessive shading



Effect of heavy and light pruning on fruitfulness. The branch at the left was taken from an eight-year-old tree that was lightly pruned each year. That at the right was taken from a similar tree that was heavily pruned each year.

portion. The formation and accumulation of carbohydrates are prevented by shading and by using them in growth so that a nutritive relation conducive to blossom bud formation is prevented from developing. The light or long system of pruning, mainly by thinning out, allows more sunlight to all parts of the tree and encourages the development of a nutritive relation that produces blossom buds. Growers should thin in the tops of trees to allow sunlight to all parts of the tree.

Pruning Bearing Trees

In pruning bearing trees, the problem is very closely correlated with the vigor or amount of annual growth of the trees. In trees of exceptional vigor, the problem is somewhat similar to the one with young trees. In this case, care should be exercised to maintain the proper nutritive relation. When very little pruning and thinning has been done in bringing the trees into bearing, and some pruning needs to be done to preserve proper balance among the scaffold limbs, care should be exercised to avoid taking out too much at any one time for fear of encouraging excessive vegetative growth. If the thinning is done from the top down, the danger of disturbing the fruiting condition of the trees is lessened; rather, in some cases, it may encourage blossom bud development by letting sunlight into the trees. Where bearing trees are older or are low in vigor, or are too dense and thick, the problem is one of increasing the vigor or the amount of growth. Here, a more vigorous growth is necessary, and more sunlight is needed in the inner portions of the tree. This condition of waning vigor in bearing trees comes on gradually, and the trees are often in a weakened condition before the grower realizes it. Trees in this condition have a low nitrogen-high carbohydrate relation, and the pruning most advisable is one of a well-

of the inner portions needs to be eliminated. In most old trees which are weak, the tops are crowded and dense. The lower and inner branches and twigs are either very weak or largely dead because of the excessive shading by the top branches. If the tops are opened up, preferably by the removal of many branches and extensive thinning of twigs, new growth will be encouraged throughout the tree. It may be necessary occasionally to remove a large limb, but most of the pruning should consist of thinning smaller branches. Of course, all dead twigs and branches should be removed. The grower should avoid cutting too severely the first year, and he will need to guard against the danger of sunburn and canker diseases. In the South, there is much danger from sunburn if the trees are opened too much. The tops of dense trees should be opened gradually so that new growth may develop to shade the limbs. In the Middle West and South, there is danger of blister canker infecting the limbs where large cuts are made, especially with certain varieties. Many growers use some form of protective coating on these wounds.

As a result of the thinning throughout the tree, new growth is developed gradually, and the trees are brought to a condition of vigor where strong blossom buds are developed throughout the tree. When this new wood has been developed, more of the old wood may be removed. With very weak trees, the grower should plan to extend the rejuvenating process over a period of three or four years.

Young Lady (on first visit to western ranch)—What is that coil of rope for?

Cowboy—That rope, lady, we use for catching cattle and horses.

Young Lady—Oh, indeed. And what do you use for bait?



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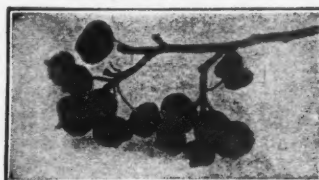
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WILLIAM M. GALE, Manager

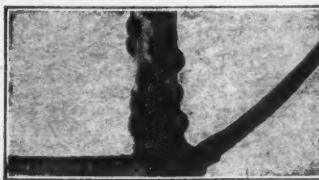
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Just one spraying

for Control of Apple Aphis, Scale Insects and Red Mite



Rosy Apple Aphis cause deformed apples. They may appear in destructive numbers any season without warning. A one spray control, saving summer nicotine sprays, is possible with Sunoco applied from the "open bud" stage until the leaves are one inch long. It is safe.



TERRAPIN SCALE (Peach Lecanium)
This is a dreaded pest, as it hibernates on the branches in the half-grown stage. It seriously attacks plum, sycamore, maple and peach.

Lime sulphur will not control it.
In the Dover, Delaware, district peach and plum trees were overrun with this destructive pest. Practically every known killer (?) was tried and the Terrapin still thrived. About two years ago they began using Sunoco (1 part oil to 15 parts water) and today the district is practically cleaned up.

Red Mite.—A dangerous new pest having several broods in summer; over-winters on trees in egg stage. Deep red and almost invisible to the naked eye.

Sunoco—1 to 20 parts of water—applied especially to the underside of branches will effectively prevent hatching.

Federal and State experts recommend good miscible oils like Sunoco, since lime sulphur is not effective on this pest.

Apple growers can save the cost of summer nicotine sprays if Sunoco Spray Oil is used in the "open bud" stage until the leaves are one inch long.

Sunoco costs less than lime sulphur and nicotine and covers 20% more trees.

Sunoco should not be classed with any other miscible oil on the market. It is always uniform; will not freeze; mixes easily with cold and hard water; is non-corrosive and pleasant to use.

Many large fruit growers' associations and city park departments have used Sunoco successfully year after year for a general clean-up of all scale insect pests.

Our entomological staff has prepared a booklet with spray schedules and uses of Sunoco.

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Poultry Tribune, Dept. 25, Mount Morris, Ill.

**Pruning the Vine in
California**

(Continued from page 4)

mature vines is simpler and no more costly than that of headed vines.

Cane pruning is the most troublesome and costly and requires the most trained judgment of the three systems. The choice of canes, their attachment to the trellis and their removal during the following winter are difficult and time consuming. Canes are used with few varieties and only where experience has shown that the variety will not bear paying crops on spurs.

However, the real cost can be determined only by comparing the actual expenditures with the returns, and late investigations show that in many, perhaps in most, cases a combination of cordons with cane pruning controlled by judicious thinning of the blossoms may, when the most practical methods have been discovered, result in sufficient increase in yield and quality to pay a profit on the additional expense.

Choice of a System

The principal commercial grapes grown in California are pruned by one

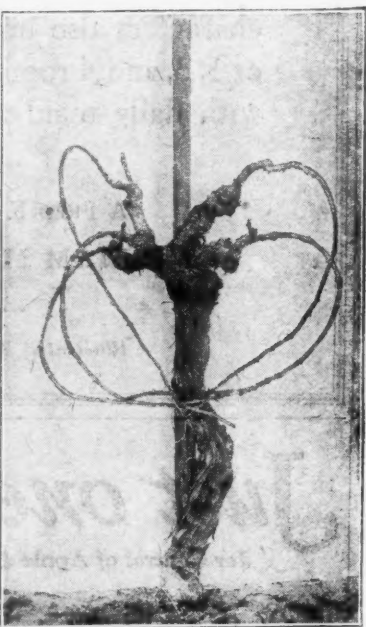


Figure 4.—A trellis can be dispensed with in cane pruning by bending the canes in a circle and tying them to the stamps. The method has the disadvantage of crowding the canes, the same as in head pruning.

or another of these three systems or by some modification of them.

Head pruning is used generally for Muscat of Alexandria (raisin Muscat), Malaga, Tokay, Black Prince and most of the wine grapes, including Alicante Bouschet, Zinfandel, Petite Sirah, Mission, Carignane and Mataro.

Some form of cordon pruning is used generally for Emperor, Cornichon, Ohanez (Almeria) and several of the newer varieties, Monukka, Molinera, Olivette, Rish Baba and Melcher's Ribier.

Cane pruning is used principally for Sultanina (Thompson), Sultana and Black Corinth, and for some of the finer wine grapes, such as Cabernet, Riesling and Semillon, which are now little grown.

Detailed directions for some of the best methods of developing vines for these three type systems will be found in Circular 277, "Head, Cane and Cordon Pruning," published by the California Agricultural Experiment Station, Berkeley, Calif.

Way It Usually Turns Out

"Hello, John. How did you come out with that car of apples you shipped on consignment?"

"Well, I didn't get as much for that car as I expected, and I didn't think I would when I shipped it."

**CHATS WITH FRUIT
GROWER'S WIFE**

By HAZEL BURSELL



Eat Vegetables Daily for Health

"EAT LARGE servings of at least two vegetables, other than potatoes or dry beans, every day."

That is the first item in a health score card recently published. Perhaps it was not considered the most important, but its position shows that the food and health authorities who compiled the test considered it of primary importance. How many people do satisfy this requirement? It would be most interesting to know. Many do, undoubtedly, during the summer who are woefully negligent during the winter and early spring months. But this should not be the case.

Big Variety Available

With the variety that can be grown in the garden and stored for winter in a dry, frost-proof place, and the successful home canning of almost every vegetable that grows, no one need lack for tender, well-flavored vegetables at any place or time. In climates less suited to vegetable raising, the supply may be secured through commercially canned products and through the many kinds of vegetables shipped in from more favored climates. Carrots, turnips, parsnips, salsify, lettuce, dry beans, squash, pumpkin, cabbage, cauliflower and celery, together with canned tomatoes, string beans, corn, asparagus and peas, are without doubt available at fairly reasonable prices in every section of the United States. Two vegetables on the day's menu should be a minimum with such a variety from which to choose.

Vegetables eaten in salads as well as hot dishes should be counted among the rest, as raw vegetables are even more valuable to the body than the cooked product. But even so, too many persons go through day after day with insufficient vegetables in their meals.

Must Teach Children

Nothing is needed then but the desire of each person to make use of what is to be had for the effort. The responsibility of the homemaker in this regard is high. More and more we are recognizing the place of vegetables in the diet for their vitamins and body-regulating properties, and the need of educating children to like them. This means that parents must not indulge their own fancied likes and dislikes, for children will learn to want certain foods or to refuse to eat them more quickly by imitation than in any other way.

Due to the botulinus-poisoning scare that has cropped up occasionally in this country, as a result of eating spoiled canned vegetables, some persons use this as their excuse for not serving sufficient vegetables. But if certain precautions are observed, there is absolutely no danger from this source. The first is to cook the vegetables no less than the minimum number of hours given in the canning time table. The next is to destroy by burning (botulinus is also poisonous to chickens and other animals) any vegetable that shows the slightest sign of decay by appearance or odor. Do not taste such vegetables under any circumstances! Lastly, boil any non-acid vegetable, on taking from the jar, briskly for at least 10 minutes before serving, even if it is to be made into salad. It may be cooled before using in the latter case. Boiling destroys the poison and renders it harmless, though it does not destroy the germs themselves.

Seasonings Needed

Any good cook can make vegetables

extremely popular with every member of the family. First, she will select tender, mild-flavored specimens, entirely free from decay. She will wash and remove a thin layer of skin, if necessary, and cook slowly in a small quantity of salted water in a tightly closed kettle (except in the case of cabbage or turnips, which should be cooked in an open kettle). All vegetables, except cabbage, are benefited by a long, slow cooking. More water may be added as needed, but the water should be permitted to boil away towards the last, so that only a few tablespoons of broth remain.

Then she will season the vegetables. One or more of such seasonings as butter, cream, milk or bacon are necessary to bring out the best flavor of any vegetable. If she uses bacon she will cut it in small pieces and cook it with the vegetable during the entire period. For a "buttered" vegetable she will place the hot cooked vegetable in the serving dish and then dot with bits of butter, which will melt and run down over the vegetables. A sprinkle of pepper or paprika will add to the flavor and appearance. Or she may add to the vegetable a small quantity of milk and butter to taste and heat to just below the boiling point, then serve hot. For a "creamed" vegetable she would add barely enough milk to cover the cooked vegetable, then thicken to a medium consistency with flour, and season with salt, pepper and butter. Meat broth also lends an excellent flavor to almost any vegetable.

Vegetables prepared in such a way as to preserve the natural flavor, and developing it to best advantage by the addition of the proper seasonings, are unfailingly popular with all who eat them. Try them and see for yourself!

Care of Velvet

SO MUCH velvet is being worn these days, velvet being one of the most popular materials for afternoon and party dresses, that it is very convenient to know just how to clean and care for it, so as to prolong the life of the garment and at the same time keep it looking "as good as new." Because of the nap, velvet requires an extra amount of care and attention to keep it looking well. The nap must be kept raised and clean to show its beauty.

Brush When Dry

If velvet should become spotted by the rain, steam the whole surface to make the color shade the same. Do not brush the velvet before steaming as that will merely make the nap cling together. Never brush the surface of velvet until thoroughly dry. Ordinary stains may be removed from velvet by sponging with a solution of alcohol, ether and water or a solution of ether and alcohol. There are special methods for removing specific stains, such as grease and paint. The garment should be sent to a reliable dry cleaner in all unusual or especially bad cases, together with a note describing the exact nature of the stain.

Much depends on the brushing of velvet. Use a piece of the material itself on a brush that has soft elastic bristles. The bristles are better when not too soft if the material really needs to be cleaned, as the stiffer bristles will bring the dust to the surface. In brushing to clean, push the bristles into the nap and twist both

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1/4 lb. prune 1/2 c. sugar

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Wash an move pits almonds, m nuts or fon

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the cloth and the brush. This will bring the dust out of the nap, and it can be easily shaken from the velvet by beating from the wrong side. Do this over every spot on the garment to be cleaned.

To Remove Wrinkles

To freshen the appearance of velvet, sponge the wrong side with warm water and then draw gently back and forth over a hot iron. If there are deep wrinkles, they may be removed by first holding the material over a pan of boiling hot water and brushing the nap with a very stiff brush, then steaming the nap up again and drying without touching. After rubbing the wrong side over the hot iron, be careful not to disturb the nap on the right side until it is perfectly dry. Seams may be pressed in the same way.

Never try to press velvet in the usual way or the nap will be ruined. Steaming, if properly done, insures good results with little or no effort. First brush thoroughly, removing all spots, and then hang in the bath-room where nothing will touch the

velvet. It would be best, perhaps, to hang on a clothes hanger on a line. Turn on the hot water and close all the windows and doors so that the room becomes full of steam. After a time turn off the water and allow the room to cool, but do not touch the dress until completely dry. A pan of water or the tea kettle may serve as a very good means of steaming small pieces.

Good Lingerie Clasps

TO ELIMINATE shoulder strap worries, put narrow lingerie tapes in the shoulder seams of each dress, sewing one end of each tape to the seam and leaving the other end to be fastened by a snap after the lingerie straps have been slipped into place. Make the tapes of the dress goods or other thin material in matching color, using a narrow fold about four inches long (enough for a pair of tapes). Turn in raw edges, stitch, press, sew a snap on each end and cut in two. The finished tape should not be more than one-fourth inch in width.

Recipes for Prune Desserts

PRUNES, long the subject of boarding house jokes, have come into their own, and now, because of their fine flavor and the variety of dishes to which they lend themselves, they stand in high favor with the average American family, and many foreign peoples as well. There is only one thing to watch out for in preparing any prune dish and that is to be sure there is always plenty of juice, in this way preventing the flavor from tasting "strong." Fresh, dried and canned prunes may be used more or less interchangeably in most recipes. To prepare dried prunes for sauce or for use in the making of dessert, wash the prunes, soak over night in water to cover generously, and in the morning cook slowly in the soaking water until tender, adding more water from time to time. This method insures delicately flavored, plump prunes when finished. Not much sugar is needed as a rule.

Prune Pie
 1 lb. prunes 1 T. lemon juice
 1/2 c. sugar (scant) 1 1/2 t. butter
 1 T. flour

Wash prunes and soak in enough cold water to cover. Cook in same water until soft. Remove stones, cut fruit in quarters and mix with sugar and lemon juice. Reduce liquor to smaller quantity. Line pie plate with paste, cover with prunes, pour over 1 1/2 to 2 T. liquor, dot over with butter and dredge with flour. Put the upper crust in place and bake in hot oven, cooling towards the last. Fresh or canned prunes make a more delicately flavored pie than the dried prunes, but little or no juice would be added in either case.

Stuffed Prunes

Wash and steam dried prunes. Dry, remove pits and fill centers with salted almonds, marshmallows, Brazil nuts, walnuts or fondant. Roll in powdered sugar.

Prune Cream Pie

1/2 c. sugar 1/4 c. chopped walnuts
 1 T. cornstarch 1 c. cooked pitted prunes
 1 c. hot milk
 2 eggs 1/2 t. salt
 1 t. vanilla

Mix sugar and cornstarch, add scalded milk gradually, cool slightly and pour over beaten eggs. Add prune pulp and chopped nuts. Mix well, pour in pie plate lined with pastry. Sprinkle top with a little grated nutmeg, and set in hot oven, reducing heat after 10 minutes. Bake slowly until firm in center, or about 30 minutes. If a more decorative pie is desired, cover the top with a fluffy meringue and brown slowly in oven after pie filling has been cooked through.

Stuffed Prune Salad

Select nicely shaped prunes, wash and prepare as for prune sauce described at the beginning of this column. Remove pits and stuff each prune with cottage cheese and half a walnut meat. Arrange on a bed of crisp lettuce with a cheese ball in the center. Sprinkle center with paprika.

Prune Whip I

15 dried prunes 1/2 c. sugar
 Whites of 5 eggs 1/2 T. lemon juice
 Pick over and wash prunes, then soak and cook slowly until tender. Remove stones and rub prunes through sieve or put through the food chopper. Add the sugar and cook 5 minutes. Mixture should resemble a rich marmalade. Beat egg whites until stiff, add prune mixture when cooled, then lemon juice. Pile lightly in buttered pudding dish and bake 20 minutes in slow oven. Serve cold with sweetened whipped cream. Nuts may be added to the mixture before baking if desired. Canned, drained prunes give even a more delicately flavored dessert than the dried prunes.

Prune Whip II

15 dried prunes 1/4 lb. marshmallows
 1 1/2 c. whipped cream 1/2 T. lemon juice
 1/2 c. sugar 1/2 c. chopped nuts
 Prepare the dried prunes as for prune sauce by soaking and cooking slowly. Remove pits and put prunes through food chopper. Add lemon juice and sugar and mix thoroughly. Cut the marshmallows in small pieces (use scissors for cutting) and mix in prune mixture. Add chopped nuts and lastly fold in whipped cream. Pile prune whip lightly in sherbet glasses and set in refrigerator or other cool place till wanted for serving. Top with teaspoonful of sweetened, flavored whipped

cream. Canned prunes may be used equally as well as the dried fruit in this recipe.

Prune Bars

3 eggs 1 c. dried prunes
 1 c. sugar 1 c. chopped nuts
 1 c. flour 1/2 t. salt
 1 t. baking powder

Wash and soak dried prunes for 3 hours. Dry and cut in small pieces. Beat egg yolks and add sugar. Beat egg whites until stiff. Mix and sift flour and baking powder into egg yolk mixture. Add nuts and prunes and fold in egg whites. Bake in shallow pan in moderate oven about 30 minutes. Remove from pan when cold, cut in bars 1 inch by 3 inches and roll in powdered sugar. The recipe makes about 20 bars.

Prune Tarts and Turnovers

1 c. chopped uncooked prunes 1/4 egg
 1 soda cracker
 Wash, dry and pit prunes; put through food chopper. To chopped prunes add the beaten egg, cracker rolled fine, grated rind and juice from one-half lemon. For tarts, line patty pans with flaky pie pastry, fill with mixture and bake in hot oven.

For turnovers, cut pastry in 4-inch squares, moisten edges with cold water, place spoonful of mixture in center, fold over like a triangle, pressing the edges together. Prick top with fork to allow steam to escape; bake in hot oven. Recipe will make 8 turnovers.

Prune Almond Cake

1/2 c. butter 1/2 c. cornstarch
 1 c. sugar 2 1/2 t. baking powder
 1/2 c. milk Whites of 3 eggs
 1 c. flour 1/4 t. almond extract
 1/2 t. vanilla

Cream butter and sugar, add milk and beat well, then sift in cornstarch, flour and baking powder, blending thoroughly. Add flavoring and fold in stiffly beaten egg whites. Bake in dripping pan in moderate oven. Cut in two crosswise, spread between layers the prune almond filling given below and cover top with the white mountain cream given below.

White Mountain Cream

1 c. sugar 1 t. vanilla or
 1/2 c. boiling water 1/2 T. lemon juice
 1 egg

Put sugar and water in saucepan, stir until sugar is dissolved and bring to boiling point. Beat egg white until stiff and add 1 T. boiling syrup. Add 4 more table-spoons syrup, one at a time, continuing the beating. Continue to let syrup boil until it will spin a fine thread 4 inches long when dropped from tip of spoon; then add to egg mixture in a fine stream, beating constantly until of right consistency to spread. Add flavoring and spread. Crease as soon as set. If not beaten long enough frosting will run; if beaten too long it will not be smooth. The frosting is soft inside and has a glossy surface.

Prune Almond Filling

To one-half of the white mountain cream recipe add 8 soft prunes, stoned and cut in pieces, and 1/4 c. almonds, blanched, cut in pieces and slightly roasted.

Table of Equivalents

1 t. equals 1 teaspoonful.
 1 T. equals 1 tablespoonful (3 t.).
 1 c. equals 1 cupful.
 1 lb. equals 1 pound (16 oz.).
 All measures are level.

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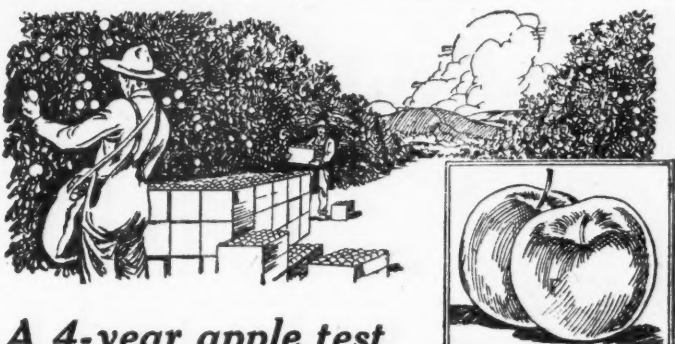


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A 4-year apple test on the Clermont County Farm—

HERE'S the story of a four-year experiment using Sulphate of Ammonia as a source of nitrogen for apple trees. The test was made on the Clermont County Farm Orchard, Clermont Co., O., during 1922, '23, '24 and '25 on bearing trees, 13 years old in 1925, under grass-mulch and tillage cover-crop methods of culture. And here are the results as given out by Mr. F. H. Ballou of the Dept. of Horticulture, Ohio Exp. Sta.

Four-Year Averages—Yield in Pounds per Tree

GRASS-MULCH		TILLAGE COVER-CROP	
With Sulphate of Ammonia	Without Sulphate of Ammonia	With Sulphate of Ammonia	Without Sulphate of Ammonia
247.3	79.1	279.6	71.6

Nitrogen application was 128 pounds of Sulphate of Ammonia per acre and an additional four-fifths pound per tree scattered under the outer branches annually. Acid phosphate at the rate of 200 pounds per acre was applied to all plots. Varieties tested were Gano, Rome, Jonathan, Grimes, Stayman and York Imperial.

The test shows that Sulphate of Ammonia produced bigger apple yields not only under the sod-mulch system, but under the tillage cover-crop method as well.

Results prove the availability of the nitrogen in

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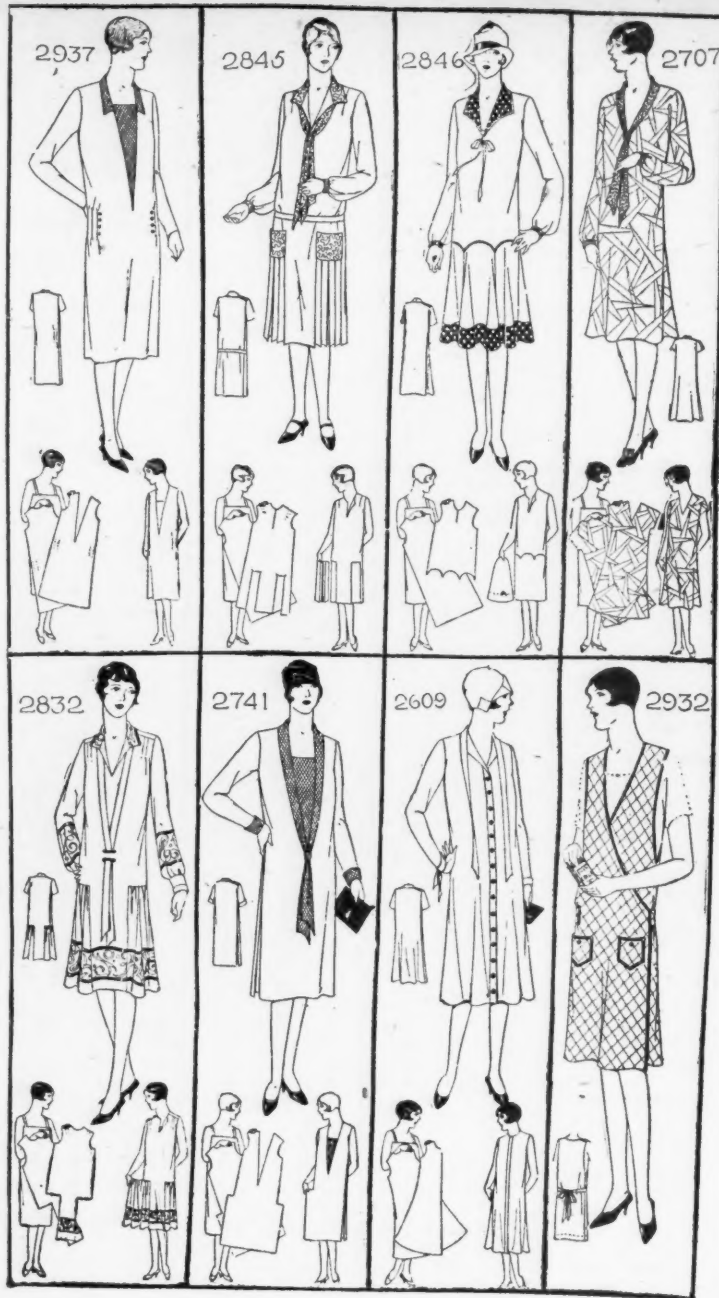
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Tests in Fertilizing Peaches

SOME interesting tests in fertilizing peaches were carried out the past season in the orchard of W. L. McCoy, McBee, S. C., in co-operation with W. J. Tiller, county agent of Chesterfield county. Nine plots were treated with different combinations of fertilizers. Perhaps the most interesting point brought out pertained to the benefit gained from the use of nitrogenous fertilizers.

Plot two received four pounds of nitrate of soda in January and four pounds of acid phosphate in March. The yield of peaches was at the rate of 5700 pounds per acre. Plot four received four pounds of nitrate of soda and four pounds of acid phosphate in March. The yield was at the rate of 6000 pounds of peaches per acre. It appears that applications of the nitrate in March increased the yield at the rate of 300 pounds per acre as compared with application in January.

Plot four received four pounds of acid phosphate and four pounds of nitrate of soda per tree in March. It yielded at the rate of 6000 pounds of fruit per acre. Plot five received four pounds of acid phosphate in March and yielded at the rate of 4087 pounds per acre. The use of four pounds of nitrate per tree, therefore, increased the yield at the rate of 1913 pounds of peaches per acre.

Black End Rot of Bartlett Pears

PROF. M. J. HEPPNER of the Division of Pomology, Davis, Calif., has been investigating black end rot of Bartlett pears, which disease has been causing enormous losses in California. The investigation has not gone far enough to permit definite recommendations. However, records taken from many trees in different sections of California indicate that Bartlett pears on Japanese roots have fewer affected pears than trees on French roots. Some affected fruits were found on trees growing on Japanese stocks, but in general it appeared that when this was the case, the trees were growing on soils which were wet in the winter and dry in the summer.

While no definite conclusions have been reached, it is suggested that inarching of trees on French roots with Japanese seedlings may prove a possible solution of the difficulty. A preliminary report on the investigation being conducted by Prof. Heppner may be obtained from the University Farm, Davis, Calif.

Seedling Apple Without Seeds or Core

F. TIELEBEIN, one of our subscribers at Stickney, S. Dak., calls our attention to a new seedling apple which has recently been reported in some of the Canadian papers.

The new variety is said to be without seeds or core. It was found in a lot of nursery trees purchased by Arthur Buzzell of Abbottsford, Quebec from a commercial nursery. Beyond this, nothing is known of the parentage of the variety.

The apple is elongated in shape and has the flavor of the Snow or Fameuse. The tree bore fruit two years ago but was barren the past season.

AGRICULTURE pays one-fifth the total cost of government in taxes. It represents one-fifth of the national wealth and contributes, normally, about one-sixth of the national income. It supplies all the food for our industrial workers and about one-third of the materials used in those industries, and under normal conditions buys each year 10 billion dollars' worth of the products of those industries. It constitutes nearly one-third of the nation's total population, and if its contribution to future citizenship is to be up to the standard we have set for American citizenship, its living conditions must also be up to the standard.—The Hoosier Farmer.

The Jujube, a New Fruit in Texas

By W. B. Lanham

Texas Agricultural and Mechanical College

FOR PROBABLY 50 years seeding jujubes have been grown in Texas as ornamentals. Only since the United States Department of Agriculture introduced improved varieties within the last few years, has the jujube been grown for its fruit. The fruit is eaten fresh, preserved and candied. The tree, with its dark glossy green foliage, not only is highly ornamental but seems particularly well adapted to high, dry portions of the country and is rapidly finding a place in home orchards.

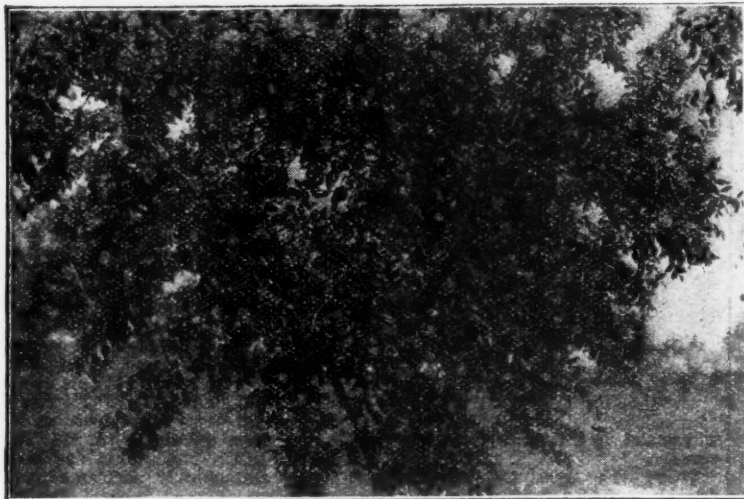
Wide Range of Adaptability

The jujube has an advantage over all other fruits in that it thrives over

green plum or olive. As the fruit becomes mature, it first takes on brown spots, at which time it is best for eating fresh. It is then crisp, sweetish and very mildly subacid. When fully ripe, the skin is chocolate colored, and the fruit is then ready for preserving. The jujube does not have the high acidity of the plum, for instance, but appeals particularly to persons who like very mild flavored fruit.

Makes Excellent Preserves

Jujubes make excellent preserves and are processed much the same way as any other fruit except that the tough skin should either be punctured



Near view of a bearing Jujube tree

a wide range of both soil and climate. It has succeeded where many other fruits have failed. It appears to reach its highest development where the weather is dry and hot, although it can withstand cold winters. During the drought in 1924 and 1925, jujubes growing on the grounds of the Texas Experiment Station at College Station fruited heavily, while other fruits were a complete failure. The trees appeared to suffer no ill effects from the drought and again fruited heavily in 1926.

The tree is an upright grower, somewhat like the pear. All varieties have dark glossy green leaves, and many of them have sparsely spiny branches, though spines are absent in most of the improved varieties.

Improved Varieties

There is very little difference in appearance between seedling trees and the recently introduced improved varieties. There is as much difference in fruit, however, between the improved varieties and seedlings as there is between a Burbank and a seedling plum.

The immature fruit is greenish in color and looks somewhat like a

or the fruit peeled with lye before preserving. When candied, the fruit looks and tastes much like the date; in fact, jujubes are commonly called Chinese dates.

The trees are planted in the winter or early spring and are given the same care as other deciduous fruit trees. Usually they begin bearing about the second year. They bloom very late in the spring, at least a month later than peaches or plums, and there is no record of a crop of jujubes having been killed by frost.

The commercial possibilities of the jujube are yet to be determined. Should a market be developed for the preserved or candied product, there would be little difficulty in producing the required supplies of fresh fruit. The jujube should have a place in the home orchard. The trees will stand much neglect. They have few pests. There is no danger of frost injury, and they do well over a wide range of climatic and soil conditions.

The best way to handle manure obtained in winter is to spread it in the freshest condition on fairly level land. The largest proportion of fertility will then be conserved.



Fruit of the Jujube

At the left is shown fruit from seedling trees. The fruit at the right is from an improved variety propagated by asexual means.

HAYES FRUIT-FOG

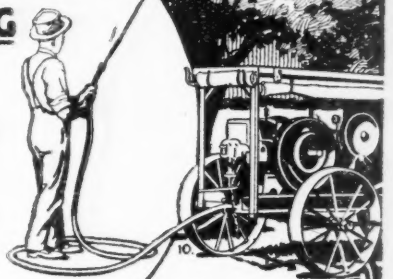
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THE JAPANESE BEETLE, which was introduced accidentally from Japan, is a serious pest in parts of Pennsylvania, New Jersey, Delaware, New York and Connecticut. Quarantines have been placed in effect to prevent its spread. A special laboratory has been established at Riverton, N. J., by the Boyce Thompson Institute for Plant Research to study this insect.

After trying out about 200 chemicals during a period of two years, the station has discovered that the beetle is most attracted by alcohols. A material called "geraniol" has been found particularly effective. The insects will come half a mile from the direction in which the wind is blowing to congregate in a huge mass on a tree sprayed with the oil.

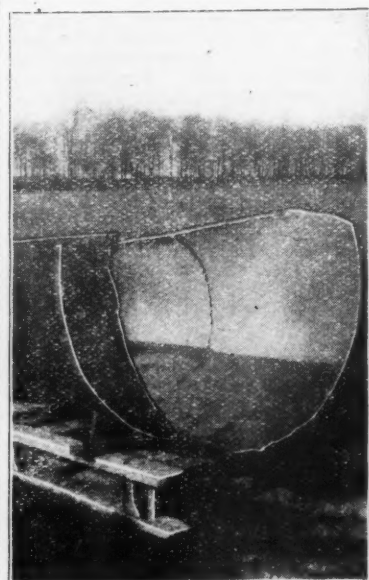
The institute has taken out public service patents for the geraniol traps in order that those who may wish to combat the Japanese beetle may do so economically and without restraint.

A Simple Type of Brush Burner

By C. L. Burkholder

Purdue Agricultural Experiment Station

EVERY fruit grower, no matter how well he may like to prune, dislikes the drudgery connected with the yearly task of gathering and burning brush. Any method or device that



A cheap brush burner made from an old boiler

will speed up this task is always welcome.

When the trees are planted far enough apart, a brush burner saves many trips to the brush pile, as well as the labor of loading and unloading.

The accompanying illustration shows a brush burner made from an old boiler. One end and the top of the boiler were cut away. The remainder was mounted on a low sled. Four iron braces bolted to the sled and to the boiler hold it firmly in place. The high sides of the outfit protect the trees from excessive heat.

Such old boilers are not in strong demand by junk dealers of the country, and frequently their owners will sell them at low prices or give them away if someone will remove them. The work of cutting out the top and one end and mounting the same on a sled is not great.

In using the burner, a little dry wood is usually required with which to start the fire. Thereafter, a good bed of coals is easily maintained, as a rule. Occasionally, the accumulating ashes must be scraped out of the burner.

In orchards where the trees are planted too thickly to permit the use of a burner, a cheap brush wagon can be made from a strip of heavy wire fencing. A piece of four by four is wired to the rear end of the strip of fence, and a piece of two by four is wired to the front end. When a sufficient amount of brush has been piled on the piece of fencing, the load is pulled to the edge of the brush pile. The horses are then unhooked and a chain or heavy wire is hooked to the four by four piece on the rear end of the strip of fencing. The wire is thrown over the load and the horses then roll the brush over on top of the brush pile. This operation is easily and quickly performed with a minimum of man labor. The brush can be rolled on a burning brush pile if one so desires.

Growth of Citrus Industry Since 1889

THE FOLLOWING tables, taken from the 1925 census report of the United States Department of Commerce, show the growth of the citrus industry in different states since 1889:

NUMBER OF ORANGE, GRAPEFRUIT AND LEMON TREES OF BEARING AGE, BY STATES, FOR VARIOUS PERIODS*
(Thousands of trees, i. e., 1,000 omitted)

ORANGE									
State.	1889. ^a	1899. ^a	1909. ^a	1919. ^a	1920. ^a	1921. ^a	1922. ^a	1923. ^a	1924. ^a
Florida	2,725	2,553	2,790	3,684	4,025	4,525	5,125	6,025	7,396
California	1,154	5,649	6,619	10,800	13,221	16,152	16,456	16,785	17,114
Arizona		49	33	47	50	55	60	63	77
Alabama		(^b)	3	260	605	660	1,500	1,700	275
Louisiana		6	141	267	104	111	119	123	151
Mississippi		(^b)	4	10	30	32	24	50	92
Texas		(^b)	1	42	14			145	165

GRAPEFRUIT									
Florida	3	117	656	1,681	2,014	2,344	2,544	2,644	2,972
California	(^b)	81	43	231	280	328	385	383	381
Arizona		3	1	19	22	25	26	26	26
Louisiana		1	3	(^b)					
Mississippi			1	1	1	1	1	2	(^b)
Texas		(^b)	5	5				1,262	1,436

LEMON									
Florida	85	23	12	34					
California	83	1,493	941	2,885	3,275	3,665	3,748	3,819	3,890
Arizona		2	2	1					
Louisiana		1	1	(^b)					
Texas		(^b)	1	1				43	49

*The figures shown are approximate only. They are intended to represent the number of citrus trees on farms and old enough to produce fruit in the year shown.

The figures no doubt include some small trees producing a negligible amount of fruit. The enumerators of the 1910 and 1920 censuses asked for orange trees and also for other subtropical fruits. In this table tangerine trees have been included with other orange trees. The enumerators of the 1925 census asked only for the number of orange trees, and the figures may include only part of the tangerine trees. In addition to the numbers shown there are in some sections a considerable number of trees on properties that were not listed as farms by the Bureau of Census.

^aIncluding tangerines.

^bData from census reports.

^cFrom records of the Division of Crop and Livestock Estimates.

^dLess than 500 trees.

^ePreliminary census report not yet available.

Grapes Damaged by Cotton Leaf Caterpillar

LATE varieties of grapes in Mis-souri were damaged considerably the past season by the adult moth of the cotton leaf caterpillar. The moth is the parent of the cotton leaf caterpillar, and it has recently been unusually abundant in southern cotton belts.

The moth is an unusual one, according to Leonard Haseman of the Mis-

souri College of Agriculture. It has strong mouth parts and is able to crack the peelings of over-ripe fruits, such as grapes, apples, peaches, etc. Numerous complaints were received from various parts of Missouri.

The moths collect in such quantities as to completely cover peaches or bunches of grapes. Even in some city markets they collected to such an extent as to damage the exposed fruit.

The college has not as yet been able to suggest a method of control.

Engineering for the Fruit Grower

By E. W. Lehmann

Study New Machines

SOMEONE has wisely said that the man who works the hardest may not get as much done as the fellow who works less but has learned the best way to do the job. This is especially true in the use of machinery—the farm worker should thoroughly familiarize himself with every new machine before it is taken into the field. It is certainly true that the farmer of today needs to be a better mechanic as well as a better business man.

Farmers of America are now using more machinery than ever before. With the present labor conditions it has been possible by the use of more machines and larger units for the individual farmer to maintain his present scale of production. Machines, the silent servants of the farmer, have taken the place of labor to a very great extent.

Since this is true, it is essential that the operator know his machine better and be able to take care of its daily needs without neglect. All farm men and boys at this time know more about mechanical equipment than ever before. Many farm tractor operators knew more about the gas motor tractors in 1926 than many mechanics knew about them 15 years ago. This knowledge is reducing the cost of operating power equipment; it is making farming more efficient and more pleasant; and it is making the use of mechanical power on the farm a successful venture.

It is certainly true that the great majority of tractor failures are due to the fact that the operators do not know their machines and are unable to take care of them. The all-important thing is to be able to detect trouble the instant it begins and, to remedy it promptly. To neglect adjusting a tractor or automobile motor when it knocks and pounds may result in an expensive repair bill. It is always wise to mix some brains with the machinery for the greatest results.

It is a pleasure to drive a car when it is running just right, but if something goes wrong, the day is spoiled. It is even worse if something goes wrong with the tractor, or if the engine or pump on the spray outfit does not work just right during the busiest time of the year and you are not able to fix it. The day is not only spoiled, but the work is delayed, and delay on the farm often means loss.

Since knowing a machine is so important in being a successful operator, why not spend a little time studying and mastering the principal machines on your farm during the winter months. Many manufacturers provide excellent instruction books. It might be a good thing to get the book before getting the machine. There are also text-books available, as well as bulletins from the United States Department of Agriculture and from the state experiment stations. Time spent in studying machines on the implement floor or in the factory, as opportunities afford, is not wasted. Many state colleges as well as manufacturers sponsor short courses where special training along machinery lines may be secured.

Check Up on Equipment

FARM management experts and business farmers tell us it is a good thing to take an annual farm inventory, because it serves as a means of checking the financial status of the farm. It tells us where we stand financially and how much progress we have made during the past year, if any, or if we have stood still. It tells us if our business is getting ahead and if we are in a position to get additional credit if the occasion demands; and lastly, it tells us the status of our working equipment.

So make an inventory and spend

some extra time in listing the condition of the machinery when each item is appraised. The appraised as well as the actual value of the machinery may be raised by giving each machine the attention it needs.

Don't forget that one of the costliest things about the farm is time. The worker who wastes time during slack seasons and does not look after the odds and ends that may affect the efficiency of operation during the busy days of the year will have a high labor charge in his cost of production. Always keep in mind the fact that the really effective worker is the one who has his tools ready before the job begins.

Getting work done at the right time is often a determining factor in maximum and efficient agricultural production. The time of planting, the time of spraying and the time of harvesting all affect the amount and quality of the crop from both field and orchard. Proper equipment in good repair is the first step toward getting the job done at the right time.

Keeping the Basement Dry

SEVERAL inquiries have recently come to my attention asking for information as to how basements might be kept dry. During wet seasons, this is always a question of interest. There are two methods of keeping water out of basements. One consists in providing drains and removing the excess water before it has a chance to enter the basement; the other method consists in making the walls and floor water tight so that no water may seep in, even though the ground may be thoroughly saturated entirely around and under the house. This year in many localities high water has filled the basements through the windows. I will not attempt to discuss how this flood water may be kept out.

The first step in keeping water out of basements is to remove the water at its source. This is best done by tile drainage. In constructing new houses, always put in a string of tile around the foundation footing just below the floor line. A good outlet to this line of tile is essential. In extremely low, flat areas where there is not a satisfactory drainage outlet, a tile such as I have described may allow water to back up in it and cause water to seep through the walls that would not ordinarily seep through.

The success of the second method is dependent on careful construction; dense, well-mixed concrete, if the walls are made of such material; and tight, well-made mortar joints, if the walls are made of brick or stone. I have seen basements in which the water actually ran in a stream through mortar joints in brick and stone walls and through cracks in concrete walls. The first step in such cases should be to make the wall and floor as nearly water tight as possible.

The second step in waterproofing a basement wall is to paint the outside of the wall with a coat of special asphalt or bituminous paint or tar compounds, such as are used by contractors for this purpose. This material is usually applied hot. Often after the first coat is applied burlap is put on and an additional coat of paint is put on to make it absolutely tight. In some instances a coat of cement mortar is applied to the first coat as a matter of protection.

If seepage water passes upward through the basement floor, it may be necessary to treat the floor as well as the wall. Two or three inches of new cement on top of the impervious tar material may be found necessary. Such materials may be secured in many localities from building or road contractors.

In applying asphalt or bituminous materials to walls or floors, it is quite essential that the surfaces be dry. It

is important, therefore, that this work be done during the dry season when the basement is dry, or at least when it has the least dampness. Apply the material hot with a fibre brush. A bristle brush is not satisfactory. It may be necessary to use a blow torch in drying the surfaces. Avoid getting flame too near the painting materials that are being applied, on account of danger of fire.

What Kind of Tile to Use

UNDER most conditions, it makes little difference as to whether clay or concrete tile are used in drainage work. If the tile are carefully made and meet the specification as set up by the American Society of Testing Materials, one kind of tile will be found to last as well as the other, except under extreme alkaline conditions which are not favorable to concrete. While there is little difference in the cost of small clay and concrete tile, it is usually found that the large clay tile are more expensive than the large concrete ones.

Some years ago there were men who argued that the porosity of the concrete tile was a decided advantage over the clay tile. It has been found, however, that to have a tile porous is a decided disadvantage rather than an advantage, because a porous tile is not as strong and it will disintegrate much more rapidly than a dense tile. However, soft burned clay tile and porous concrete will last almost indefinitely if laid to sufficient depth so they will not be affected by freezing and thawing and other atmospheric changes.

Dense, hard burned clay tile are always considered a better product than the soft burned clay. For outlets, where the tile are brought to the surface, such tile should always be secured. Sometimes second grade sewer tile may be secured to advantage for outlets.

A simple test to determine the quality of a tile is the ring test. The tile is held and struck lightly with a metal rod or a light hammer. The hard burned, dense tile will give a clear ring, while the soft burned or defective tile will give a dull ring.

Proper Housing Essential to Success with Poultry

A STATEMENT made by the New York State Agricultural College is that "Much of the success of Cornell in connection with poultry husbandry is said to be due to the fact that the poultry department of the New York State College of Agriculture has devised most of its own plans for poultry houses and appliances, after long experiment and experience."

This is not peculiarly true of the New York Experiment Station, for Missouri has its type of poultry house that has done much to make poultry husbandry a success in that state. Iowa also has devoted a lot of attention to the matter of poultry housing, and Illinois has her plans. So it is with the other states.

It is evident that the prospective builder of poultry houses and poultry equipment should turn to his experiment station for the best plans available. In most cases there is a slight charge for blueprints, but the amount is negligible when compared with the value of the plan.

Pat had been smoking but his pipe was in his hand when the conductor on the street car approached him and said:

"You can't smoke in here."

"I'm not smoking."

"No, but your pipe's in your hand." "Sure," came back Pat, "Me fate's in me shoes, but I'm not walkin'."

Doctor Recommends This Tobacco to Pipe-Smoking Patients

His own happy experience with this particular tobacco led him to recommend it to others

There seems to be an unwritten law among pipe-smokers. When one man discovers a way to get more enjoyment out of his pipe, he feels obligated to tell the "pipe-smoking fraternity" about it.

So it is not surprising that when Doctor Gardiner of Florida found a tobacco that really enabled him to enjoy a pipe for the first time, he made a point of recommending it to all his pipe-smoking patients.

You'll find his letter interesting.

Larus & Bro. Co.,
Richmond, Va.

Dear Sirs:

No harm done, I hope, if I feel like I want to say a word of praise for Edgeworth Ready-Rubbed.

I have tried many kinds of tobacco in a pipe, but until I got to smoking Edgeworth I never really enjoyed a pipe.

Frequently I say to patients who must smoke: "If you're going to smoke your pipe, use Edgeworth."

I like it and recommend it wholeheartedly to anyone who enjoys smoking.

Yours truly,

W. D. Gardiner, D. O.

There seems to be something about Edgeworth that gives a degree of smoking satisfaction that a man simply can't keep secret. He wants to "tell the world" about it—once he has discovered it for himself.

Of course, until you try Edgeworth, you won't know what this "something" is. For that reason we invite you to take advantage of our standing offer.

Let us send you free samples of Edgeworth so that you may put it to the pipe test. If you like the samples, you'll like Edgeworth wherever and whenever you buy it, for it never changes in quality.

Write your name and address to Larus & Brother Company, 13-M S. 21st Street, Richmond, Va.

We'll be grateful for the name and address of your tobacco dealer, too, if you care to add them.

Edgeworth is sold in various sizes to suit the needs and means of all purchasers. Both Edgeworth Plug Slice and Edgeworth Ready-Rubbed are in small, pocket-size packages, in handsome humidor holding a pound, and also in several handy in-between sizes.

To Retail Tobacco Merchants: If your jobber cannot supply you with Edgeworth, Larus & Brother Company will gladly send you prepaid by parcel post a one- or two-dozen carton of any size of Edgeworth Plug Slice or Edgeworth Ready-Rubbed for the same price you would pay the jobber.

On your radio—tune in on WRVA, Richmond, Va.—the Edgeworth station. Wave length 256 meters.



Sensational Typewriter Offer



The World's Only Ball Bearing Typewriter

NEVER has there been such a typewriter bargain on as easy terms! A genuine Silent Ball Bearing L. C. Smith at a 40% savings!

Only the L. C. Smith has all these features: Ball bearings (36 of them) at all points of wear. All the writing visible all the time. Non-shift carriage. 2-color ribbon. All the latest operating conveniences. Beautiful—renewed.

If you decide to keep it only **\$3.00** DOWN BALANCE PAID LATER

Guaranteed 5 Years Money cannot buy a better typewriter. U. S. Government bought 50,000. The choice of railroads, big corporations like the Standard Oil Co., etc., because of its exclusive ball bearing feature. Easiest running, longest wearing of typewriters.

Send No Money!

Just mail coupon. Without delay or red tape, typewriter will be shipped you. Use it 10 days. See how speedy and easy it runs—the perfect work it turns out. If not delighted, return at our expense. You'll want to keep it. You can, for \$3 down and \$5 monthly. Now is the time to buy. \$3 worth of extra free. Send coupon now before offer is withdrawn.

40% SAVED by Using this Coupon

SMITH TYPEWRITER SALES CORP.

151-360 E. Grand Ave., Chicago

Ship me the L. C. Smith, F. O. B. Chicago. On arrival I'll deposit \$3 with express agent. If I keep machine, I'll send you \$5 a month until the \$60.70 balance of \$63.70 price is paid; the title to remain with you until then. I am to have 10 days to try the typewriter. If I decide not to keep it, I will repack and return to express agent, who will return my \$3. You are to give your standard 5-year guarantee.

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City _____ State _____
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On the Ocean Front

The Breakers

ATLANTIC CITY, N. J.
Preferred in Winter
American and European Plans. Sea Water in All Baths
Orchestra
Afternoon Tea
Therapeutic Baths
Dancing
Golf Privileges
Fire-proof Garage
JOEL HILLMAN, President

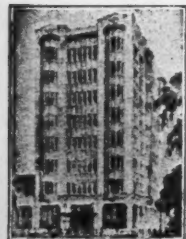
HOTEL EMPIRE

Broadway at Sixty-Third Street, New York
In the heart of the automobile district

RATES
Single room with private bath, \$2.50
Single room with private bath, \$3.50
Double room with private bath, \$5.00
M. P. MURTHA, General Manager.

HOTEL IMPERIAL

For the Tourist or Transient Guest



Who prefers restful and homelike atmosphere. Just a short walk from the business, shopping and theater districts, yet away from the downtown noise and congestion.

RATES:
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All Outside Rooms
All With Baths
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DETROIT

Pruning the Bartlett Pear

(Continued from page 7)

the owner naively admitted was "purty fair."

The question as to how much new growth should be expected of bearing trees in order to provide for renewal of the spur system is a pertinent one. The desirable amount of new growth will necessarily vary with the age of the tree, and to some extent with the locality. For trees which are in bearing but which have not attained approximately full size, new growth of from 12 to 18 inches will provide new fruit wood and at the same time bring

prevalent, which in later years has more than offset the delay in fruiting due to the heavier cutting practiced to secure this form.

At planting time the tree is ordinarily pruned to a whip 24 to 30 inches tall. The first pruning usually leaves three scaffold branches spaced about six or eight inches apart on the trunk. These are cut back moderately and all to about the same length if an open center tree is desired. If the modified leader type is to be used, the uppermost branch of the three is left

capable of bearing heavy crops by using the laterals which are produced so abundantly on the main framework branches.

Difficulties in Pruning Young Trees

It should not be inferred, however, that pruning of the young Bartlett pear tree is always an easy task. Many difficulties are encountered during the first two or three prunings, and no pruner, after spending a day working on young pear trees, can justly complain of any lack of mental exercise in figuring out just what to cut off and what to leave. One of the chief difficulties with the Bartlett is to make the young tree spread. It is naturally a rather upright grower when young and often does not spread until it comes into bearing. One of the methods used to a limited extent to help make the young tree spread is the Caldwell system described by Tufts in the AMERICAN FRUIT GROWER MAGAZINE for January, 1926. Another method* consists in holding the branches apart by pieces of wood removed in pruning, twisted together as shown in Figure 4. If these home-made spreaders remain in place for one season, the branches will not come together again.

Another difficulty often encountered in sections where the growth is extremely rapid during the first few years is that the young branches are



Figure 3—A, Nine-year-old Bartlett pear tree consistently pruned by thinning out and cutting back to laterals where necessary. B, The same tree after removal of one or two large branches to prevent crowding in later years

the tree up to full size. With older trees, occupying all or nearly all of the available space, from six to 10 inches of new growth is probably sufficient to provide for production of new fruiting wood and to maintain the tree in a vigorous condition.

Pruning the Young Tree

Results from many experiment stations, both in this country and in Europe, have emphasized the fact that heavy pruning of young trees not only dwarfs the trees but markedly delays bearing. Under the growing conditions found in most fruit sections of California, the delay in coming into bearing is usually more apparent than the dwarfing effect. Some pruning seems to be necessary with young pear trees in spite of these deleterious results following its use. A certain amount of training is desirable in order to secure a tree with the scaffold and secondary branches properly spaced in order to produce a strong tree capable of carrying the load of fruit in later years, and also to facilitate certain cultural operations. Most of this training is now done in three or four years, whereas it formerly took at least twice as long. Many pear trees were formerly cut back heavily each year because of the prevailing impression that the trunk and scaffold branches were being made "stocky" by this practice.

The forms of training generally adopted for pear trees in California are the usual open center type and the delayed open center or modified leader type. In some cases the trees are allowed to grow with the true central leader. Inasmuch as the pear tends to form central leaders, the open center type requires somewhat heavier pruning than other types of pruning. However, the open center type appears to have certain advantages in sections where pear blight is

considerably longer than the other two. At the time of the second pruning, about two branches are left on each of the three scaffold limbs at a height of about three to five feet from the ground. These secondary branches, if excessively long, are usually headed back moderately. Nearly all of the other laterals which may have formed in the top of the tree are removed; sometimes several laterals situated rather low on the main branches are left to form "hangers" which have been found to begin bearing very early. Thus, at the beginning of the third growing season the tree has three scaffold branches, starting from the trunk, knee-high or a little higher, and from five to seven secondary branches arising from the main scaffolds about three to five feet from the ground. These branches constitute the framework upon which the rest of the tree is produced. After the second pruning, a light thinning (Figure 2, A and B) has been found to give best results, both for size of tree and early bearing. In case the tree was started with a modified central leader, this number may gradually be suppressed after the fourth or fifth year, giving what is in effect an open center tree. The photographs show an open center tree which has been handled in this way, and the number of fruit spurs formed by this method of pruning is clearly indicated (Figure 2, C and D).

One of the reasons why this method of thinning out without cutting back has proved to be so satisfactory with the Bartlett is that this variety tends to produce lateral branches in abundance (Figure 3). Other varieties, such as the Bosc, for example, tend to grow from the terminal bud only and produce a tree with a few main branches and but few laterals. The Bartlett, after the growth has slowed down to some extent, can easily be pruned to give a symmetrical tree

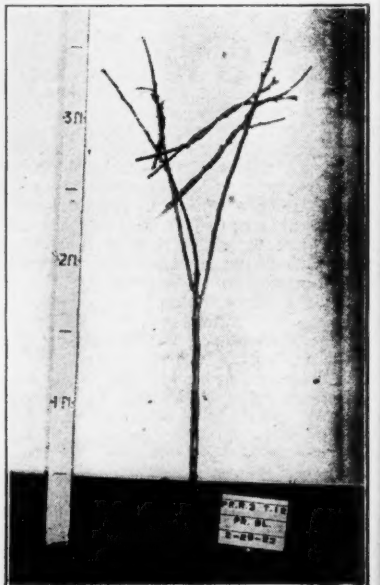


Figure 4—Young pear trees may be trained to a more spreading habit by bracing with twigs as shown in this picture

easily bent to the ground by the weight of foliage alone. At other times an occasional fruit may set near the end of these upright branches. If this fruit is not discovered and removed the branch may be pulled down and may have to be removed later. In case there is much trouble from these long slender shoots bending down, it may be necessary to cut back more heavily. This practice helps to remove the danger of bending due to the weight of foliage on the extremities of slender branches.

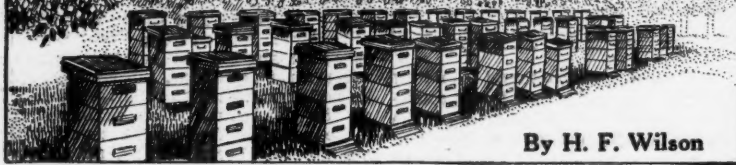
"DISEASES of Raspberries and Blackberries" is the title of Bulletin 1488-F, which has recently been issued by the United States Department of Agriculture.

This bulletin includes the most recent information in regard to mosaic, leaf curl and other serious diseases of the bramble crops. Copies can be secured from the Department of Agriculture, Washington, D. C.

I get great pleasure in reading the AMERICAN FRUIT GROWER MAGAZINE, for it has helped me in bringing my 40-acre orchard to where it is.—B. D. S., Missouri.

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Bee Keeping for Fruit Growers



By H. F. Wilson

Make Idle Time Profitable

USE YOUR spare time during the winter to put your bee equipment in shape. Hive bodies and other equipment can be painted and repaired. It is unprofitable for any beekeeper to use poor combs. It will pay to carefully sort all brood frames and extracting frames not in use. Crooked and broken combs should not be tolerated. Combs containing elongated cells near the top bar should be used only for storing honey and should not be used in the brood chamber. Combs containing 10 per cent or more of drone cells should not be placed in the brood chamber, but they may be used as extracting frames. Combs containing more than 40 per cent drone cells should not be used at all, as there is always too much chance of their being put in the brood chamber. Sort over the combs carefully—cut out the undesirable combs and either melt them into wax or pack them in gunny bags and ship them to a wax rendering plant.

Colonies Light in Stores May Be Fed in Winter Quarters

BECAUSE of the unusually cold and bad weather which prevailed during the past fall, many colonies will undoubtedly have been put into winter quarters without sufficient stores. If additional stores are not given to these colonies in some manner, they will die of starvation before spring. Ample food for these colonies can be provided by feeding them sugar syrup in the bee cellar. Attach a feeder to the entrance of the hive or place one on top of the frames and provide sugar syrup as ordinarily prepared for outdoor feeding.

Winter Stores More Important than Winter Protection

BEES seldom die in winter quarters because of poor bee cellars or poor packing cases. They may die out during the winter from two main causes: bad stores or a lack of stores. The important types of protection to have around bees are good windbreaks. With this kind of protection bees can winter successfully without any outside packing or other protection. Any bee cellar in which the temperature can be kept above freezing is good, and if the bees die out within the cellar, it is because of poor stores and not because of the bee cellar. Any type of packing material, regardless of the kind of packing case used, will give reasonably good protection. Clover chaff, straw, forest leaves and shavings are the most common materials used in packing cases. If they are thoroughly dry, all of them will prove satisfactory if the apiary site is protected by a windbreak. Good stores, free from gums and dextrins, is 75 per cent of successful wintering.

Beekeeping Books for the Public

"HONEY Bees and Fairy Dust" is the title of a wonderfully interesting book written by Mary Geisler Phillips, wife of Dr. E. F. Phillips of Cornell University.

This book is written in story form for children and contains a delightful account of the life of the honey bee as it might be seen by a little boy or

little girl, transformed into fairy bees. It is accurate in scientific detail and will make a strong appeal to all students of nature.

"Honey Way Menu Book" is the title of a recipe book prepared and published by Miss Malitta D. Fischer of Madison, Wis. This is the only recipe book published in which honey is practically the only substance used for sweetening purposes. This little book contains 60 pages and has 200 recipes with menus and special menus for holidays and parties. It is of particular interest to the housewife at this time because the Kellogg Company of Battle Creek, Mich., is recommending honey for use in sweetening corn flakes; and the Heinz Company is recommending it for use with their new product—"Heinz Rice Flakes."

Beekeepers will find this book helpful in advertising, and the public will find it valuable because of the many new delicious food preparations listed. Honey is said to give a delicious flavor and extra brown color to fish and steaks brushed with honey before frying.

The National Beekeepers' Meeting

AN IMPORTANT event in connection with the Beekeeping Industry of America will be the American Honey Producers' League Convention to be held at New Orleans from January 25 to 28, 1927.

Beekeepers who are planning to spend a part of the winter in the South will find it both profitable and enjoyable to attend this meeting. Questions of national importance will be brought up and fully discussed. Marketing will be the main topic of discussion, and in addition, transportation and national advertising will receive some attention.

The meeting place has not yet been announced, but beekeepers who are interested may secure this information by writing to R. G. Richmond, national secretary, at Fort Collins, Colo.

Beekeeping in Roumania

ROUMANIA is said to have 650,000 colonies of bees and 43,000 beekeepers. The honey crop in 1926 was 8,430,000 pounds.

"Spreaders" Do Not Increase Killing Efficiency of Sprays

GLUE, calcium caseinate and soaps of various kinds used as "spreaders" in common spray mixtures employed against the insect pests and diseases of apples failed to give any appreciable increase in the killing efficiency of the sprays in tests carried on by the entomologists at the New York State Experiment Station at Geneva. This statement is made by the station entomologist in a report on the work of the station for the past year. The report is available for free distribution to all those interested.

"No appreciable improvement in the killing efficiency of common spray mixtures was derived from the incorporation of such materials," says the station entomologist with reference to "spreaders." "Theoretical considerations suggest the desirability of adding calcium caseinate to the lime-sulphur and lead arsenate spray as a means of avoiding certain undesirable chemical reactions. The casein ma-



Dormant Dusting with Tractor Equipment.

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AND now the Duster does it all for Niagara Dormant Dust, an exclusive Niagara Product of Soda Sulphur origin, actually takes the place of the Dormant Spray.

This superfine powder absorbs moisture from the air and forms a concentrated film of protection over the branches. When used as a delayed dormant on apples, it will kill scale, also aphids already hatched and in the cracked stages. It will also protect the bursting bud from scab infection.

Numerous other Niagara Dusts have been perfected to take care of each crop and pest. Some one of the various models of Niagara Hand, Traction or Power Dusters (equipped for horses or tractor) will just meet your acreage and crop requirements.

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THE CENTAUR TRACTOR COMPANY
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terial also serves a very useful purpose in the preparation of such sprays as sulphur suspensions and lubricating oil emulsions."

The report also touches on many other lines of work having to do with the control of insect pests of fruit and vegetables, and on the numerous other activities of the station research workers.

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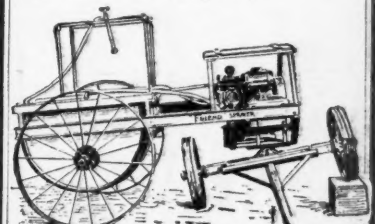
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Profitable Poultry

By Ralston R. Hannas

January Care of the Layers

CONDITIONS are much different now than in March, April, May and June, which account for the fact that there are not so many eggs in the nests as in the spring. However, if these conditions are made as nearly as possible like the spring conditions, there should be some improvement in the egg yield. In the spring and early summer, the hens are able to get out and rustle up a good bit of their food, providing, of course, they have free range. Where birds are kept yarded the year around, this fact does not apply to so large an extent.

Feeding, then, is the important item. A good grain ration, such as any of the good commercial grain mixtures or one composed of two parts cracked corn and one of wheat, fed in the litter at the rate of from 13 to 15 pounds per 100 birds per day, will help keep the hens in good condition, while a good laying mash (dry) kept in hoppers all day will help to get the eggs. Here, again, a good commercial egg mash can be fed to advantage, or a mash can be mixed of equal parts of bran, middlings, corn meal, ground oats and meat scrap. If it is desired, the grain can be mixed in the mash and the whole fed in hoppers.

If the hens are not in such good condition as they might be, cod liver oil in the ration at the rate of two per cent of the amount of mash fed can be fed with good results. Mix it right in the mash. The use of glass substitutes in the laying house will also be of benefit to the hens, as these substitutes allow the short rays of the sun to enter the house. It is these short rays, known as the ultraviolet rays, that make it possible for the hens to assimilate more mineral matter, and it is mineral matter that hens need to maintain laying as well as health.

Plenty of green food, drinking water that is not frozen most of the time, grit and oyster shell are all necessary in the feeding scheme, as is clean, dry litter. If the litter gets wet as the result of a storm, remove it and replace with fresh, dry litter.

Clean nesting material will help to produce clean eggs, and there's a matter of from 13 to 15 cents a dozen difference between dirty and the best clean, fresh eggs. Plenty of nesting material in the nests will prevent broken eggs in the nests, for when the bottoms of the nests are bare, the eggs will very likely break as soon as they are laid. Shavings make good nesting material.

It is sometimes a hard job to produce clean eggs because hens insist on sleeping in the nests at night. This can be remedied by having a hinged board in front of the nests, if they open in the front, the board being hinged either at the top or bottom. During the day, this board can be raised or lowered, as the case may be, to allow the hens to enter the nests at will, and at night, the board can be lowered or raised, as the case may be, to cover the nests, thus preventing birds from entering to spend the night there. This makes it necessary, of course, to make a visit to the chicken house just before dusk to remove any birds from the nests that may have gone there.

Early Hatching

THERE are many advantages in hatching a portion of the flock early. In the first place, an even production as far as season is concerned can be maintained, thereby maintaining the income at a time when it is natural for it to fall off. As most people hatch their birds at such a time that they come into production in late October or early November, there is a time when the production falls off considerably, due to the fact that the

old birds are moulting and the new ones have not yet come into production. If, therefore, a portion of the flock can be hatched so that they will lay earlier, they will fill up this gap and maintain the income materially.

Birds that are hatched in January or February will start to lay in July or August and will lay for two or three months before going into a moult. They will then have a slight moult, but it will be a sufficient rest to make them qualify as breeders, that is, they can be used as breeders the following spring. They will not lose a great deal of time through this moult. Some poultry keepers endeavor to prevent this moult by using lights on these birds in late September or early October. Such birds that are put under lights, however, should not be used as breeders.

Early hatching also has the advantage of coming before the rush of the general farm work, so that better attention can be given to the incubators and brooders. Mortality is, as a rule, not so high with early hatched chicks, and now, with the help of cod liver oil, there should be little difficulty in raising these chicks to maturity. In sections where the summer is very hot and dry, early hatching has a distinct advantage over later hatching.

Egg Eating

EGG EATING is a habit that frequently starts from eggs being broken accidentally in the nests. Once the hens taste the eggs, they like them and will soon find out how to break them. Thus, egg eating may be started by not having sufficient nesting material.

There is another possibility as to the cause of egg eating. Why are the eggs broken? There may be plenty of nesting material, but the eggs still break. It may be that the shells are extremely thin due to a lack of minerals in the ration. Plenty of oyster shell before the chickens all the time will help, as these shells contain calcium, which is needed by the birds for the manufacture of the egg shells. No doubt the addition of other minerals will have the desired effect and will be of more value than the oyster shell alone, as other elements will be added to the ration which will help supply the needs of the hens more fully.

Any of the commercial mineral mixtures are good and should be of value. Another mixture that may be used instead is one composed of 60 pounds of steamed bone meal, 20 pounds of calcium carbonate and 20 pounds of salt. Mix this well and add to the ration at the rate of two per cent of the amount of mash fed. Cod liver oil should also be of value here, as it makes the minerals in the ration more easily assimilated by the birds.

Swat the Rat

RATS do a tremendous amount of damage in the course of a year, and it behooves the poultry keeper to fight them continuously. Prevention, of course, in the form of rat-proof houses, feed bins, etc., is a large part of the battle, for it does no good to have rat hunts, to set traps and to use rat terriers if the holes are not plugged up properly or if the buildings are not constructed to keep them out.

Buildings set on posts or pliers, cement floors where buildings are on the ground, wire netting buried in the ground around the four sides of the house, if wood floors are used, and metal lined feed bins, all help to keep the pests out. There are all sorts of rat poisons, cultures of diseases that will affect rats alone, gases and traps on the market that will be effective to some degree. Whatever is used, it

must be kept at eternally until the rats are driven out, then proper steps must be taken, as hinted above, to make the house as near rat proof as possible.

A point to note in the use of traps is that rats will never go near a trap in which another rat has been killed. After a rat is caught, the trap should be boiled in water to remove the odor of the dead rat. This accounts in large part for the fact that rats will not go near certain traps, no matter how cleverly these traps are baited and where they are set.

Feather Pulling

WHEN feather pulling starts in a flock, it may be due to lack of the proper protein in the ration, but the chances are that it is purely a vicious habit. Various remedies may be used in an effort to check the spread of this habit, but the only sure way is to watch for the ringleader and remove her from the flock. It is surprising how fast this habit will spread unless checked. It may mean spending a couple of hours in the hen house watching the birds, but once the guilty ones are caught and removed, the trouble ceases. Sounds like a good way to waste time, but it is the only way to break up this habit.

Algiers Wasp Imported to Pollinate Smyrna Figs

ALTHOUGH certain varieties of fig (mainly the Black Mission) had been grown in California since the days of the Spanish Fathers, it was for more than a century impossible to produce the fig of commerce—the Smyrna type. The trees would thrive, but the fruit would "drop" before it matured. In the search for a remedy, trees of fine Smyrna strain were imported and planted. These, like others, failed to mature a crop. The Caprifig, a wild variety native to southwestern Asia and southeastern Europe, which produces three crops a year and carries the fruit of the third ("mamme") crop on its branches through the winter, was then planted in California orchards in the hope that it would fertilize the cultivated fig. This also gave no result.

Finally, in the course of experiments, some Caprifig pollen was introduced on a toothpick through the small "eye" of the immature Smyrna fig to reach its hidden flower. The figs thus fertilized grew to maturity. This proved that the trouble lay in lack of proper pollination. The flower of the fig is on the inner wall of the fruit and can be reached only through an "eye" or orifice so minute that bees and other insects that ordinarily pollinate fruit cannot touch it.

A long search to find a pollinating insect was then made in countries where Smyrna figs were successfully grown. This was at last found in the fig wasp (blastophaga), a tiny insect that lives through the winter in the fruit of the Caprifig. The female, emerging in spring "dusted" with Caprifig pollen, flies to a nearby branch and enters the budding figs to lay her eggs. There followed a decade of unavailing efforts to introduce these useful insects to California. Finally, in 1899, with the aid of the United States Department of Agriculture, a few were successfully brought from Algiers. They multiplied rapidly and in the following year the first crop of Smyrna figs ever grown in California was produced. They were named "Calimyrna" figs.—Rosenberg Brothers and Company, in California Fruit News.

Mediterranean Fly Found in Tomatoes

THE MEDITERRANEAN fruit fly was found by state inspectors in California recently in some tomatoes found in the locker of an oil tanker which came from New Zealand via Honolulu. The vessel made port at Los Angeles. The tomatoes were confiscated and burned.

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